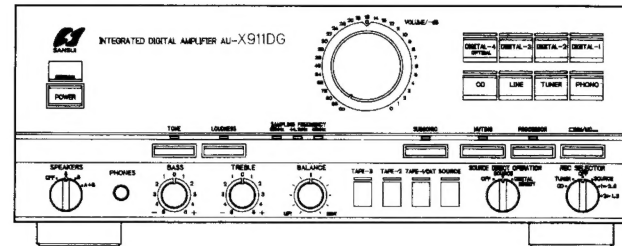




SERVICE MANUAL

AU-X911DG

INTEGRATED DIGITAL AMPLIFIER



CAUTION

- Parts identified by the Δ symbol on the schematic diagram and the parts list are critical for safety. Use only replacement parts that have critical characteristics recommended by the manufacturer.
- Make leakage-current or resistance measurements to determine that exposed parts are acceptably insulated from the supply circuit before returning the appliance to the customer.

NOTE

The symbols, EU, EG, SS and XX <EXPORT> in this Service Manual mean followings respectively.

EU Manufactured for European market.
(Except F.R. Germany)

EG Manufactured for F.R. Germany market.

SS Manufactured for Saudi Arabia market.

XX Standard Version.

<EXPORT>

NON MARK Common Parts.

Specifications

Power output

Min. RMS, both channels driven, from 20 to 20,000 Hz, with no more than 0.005% total harmonic distortion.
100 watts per channel into 8 ohms.

DIN

120 watts per channel into 4 ohms.

Load impedance 4 to 16 ohms

Intermodulation distortion (60 Hz: 7 kHz = 4:1 SMPTE method)
..... less than 0.005% at rated power output

Frequency response (at 1 watt)

Overall (from CD) DC to 200,000 Hz, +0 dB, -3 dB
RIAA curve deviation (PHONO-MM, 20 Hz to 20 kHz)
..... +0.2 dB, -0.2 dB

Input sensitivity and impedance (at 1 kHz)

PHONO (MC) 300 μ V/100 ohms

European models only

PHONO (MC TRANS) 160 μ V/16 ohms

PHONO (MM) 2.5 mV/47 kohms
(Max. input capability: 210 mV at 1 kHz, less than 0.01% total harmonic distortion)

CD, TUNER, LINE 150 mV/47 kohms

TAPE/DAT PLAY-1, 2, 3 150 mV/47 kohms

PROCESSOR RETURN 150 mV/47 kohms

Output level (1,000 Hz)

TAPE/DAT REC-1, 2, 3 150 mV into 47 kohms

PROCESSOR SEND 150 mV into 47 kohms

Signal to noise ratio (short-circuit, A-network)

PHONO (MM) 86 dB

CD, TUNER, LINE 110 dB

TAPE/DAT PLAY-1, 2, 3 110 dB

Controls and Filter

BASS \pm 6 dB at 50 Hz

TREBLE \pm 6 dB at 15 kHz

SUBSONIC -3 dB at 16 Hz (12 dB/oct)

MUTING -20 dB

LOUDNESS +6 dB at 50 Hz

(VOLUME: -30 dB position) +3 dB at 10 kHz

Digital Audio

Frequency response 4 Hz to 20 kHz, \pm 0.5 dB

S/N 100 dB

Dynamic range 98 dB

Harmonic distortion (1 kHz) 0.003%

Digital input level/impedance 0.5Vp-p/75 ohms

Digital output level/impedance

..... 0.5Vp-p/75 ohms

Optical input/output 660 nm (emitted light wave length)

Power requirements AC 120V/220V/240V,

50/60 Hz

For U.S.A. & Canada AC 120V, 60 Hz

Power consumption 560 watts 680 VA Rated

720 watts Maximum

Dimensions 430 mm (16-15/16") W

163mm (6-7/16") H

450 mm (17-3/4") D

Weight 18.2 kg (40.1 lbs) net

20.0kg (44.1 lbs) packed

Accessories

Remote Controller (RS-1130) 1

Batteries (SUM-3/AA-size) 2

* Design and specifications subject to changes without notice for improvements.

* Due to local laws and regulations, this unit sold in some areas are not equipped with variable voltage selectors.

AU-X911DG

1. ADJUSTMENT

- Conditions:
1. Ambient temperature 18°C to 28°C
 2. VOLUME Minimum
 3. SPEAKERS-A switch is ON.
 4. SOURCE DIRECT OPERATION switch is set at SOURCE.
 5. If the protector relay operates, remove the bottom plate and connect a DC voltmeter as described below.
H/G balance: Between ⑤ and ⑥
H/C balance: Between ⑤ and ⑥

1-1. F-6160 Driver AMP Adjustment (See Figs. 1-1 and 1-2)

STEP	SUBJECT	MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
1	HOT/GND balance adjustment (L, R-CH)	Connect a DC voltmeter between the HOT speaker terminal and the GND terminal for the left channel. Connect for the right channel in the same way.	KVR2 (F-6160) (L, R-CH)	DC 0V \pm 50mV	
2	HOT/COLD balance adjustment (L, R-CH)	Connect a DC voltmeter between the HOT and COLD speaker terminals for the left channel. Connect for the right channel in the same way.	KVR1 (F-6160) (L, R-CH)	DC 0V \pm 30mV	

Fig. 1-1 F-6160 adjustment volume position (seen from above)

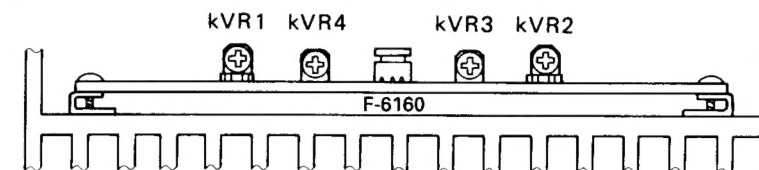


Fig. 1-2 F-6169 DC voltmeter connection points (seen from below)

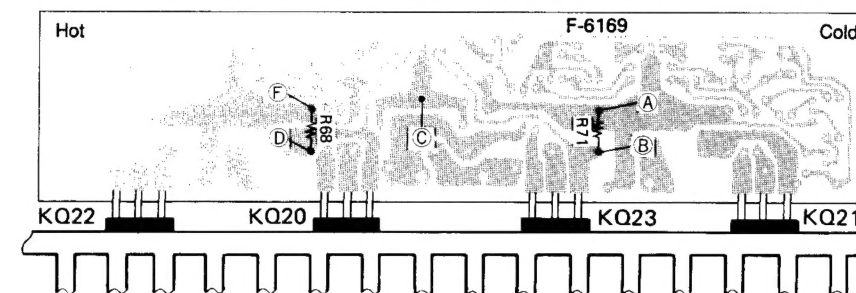
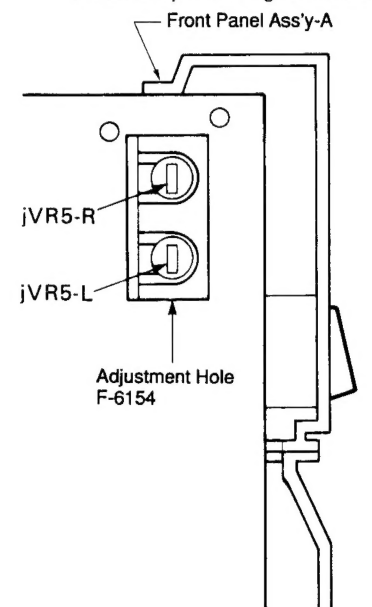


Fig. 1-3 F-6154 adjustment volume position (reached by removing left side cover)



1-2. F-6154 Flat AMP Adjustment (See Fig. 1-3)

Condition: For adjustment of this flat amp only, set VOLUME at maximum.

STEP	SUBJECT	MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
1	HOT/COLD balance adjustment	Connect a DC voltmeter between the HOT and COLD speaker terminals for the left channel. Connect for the right channel in the same way.	jVR5L, R (F-6154)	DC 0V \pm 10mV	* Set the SOURCE DIRECT OPERATION switch to SOURCE.

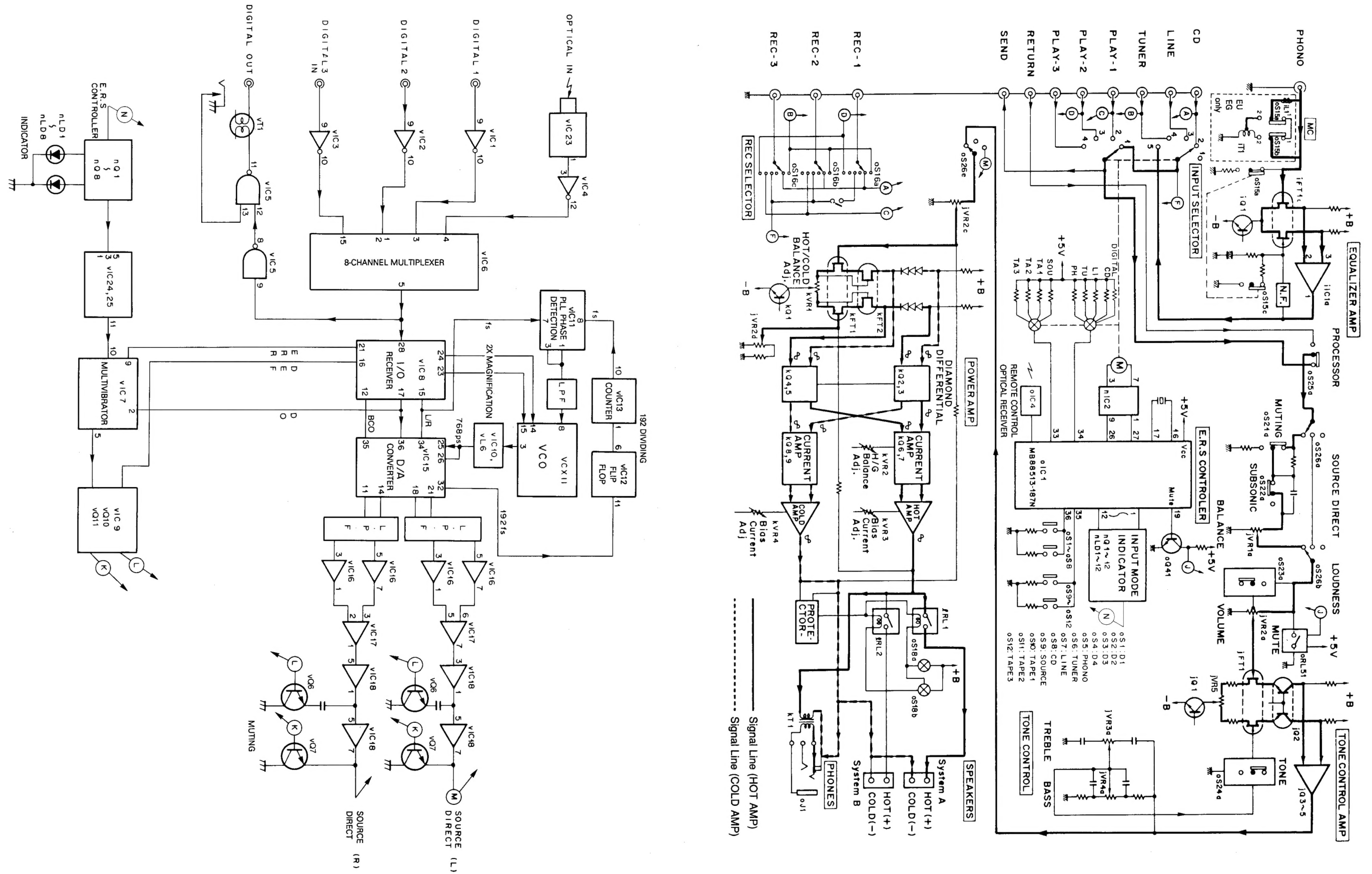
Note: When using a metal flathead screwdriver, insulate it and never allow the metal part of the screwdriver to touch the chassis within the adjustment hole.

1-3. F-6169 Power AMP Balance Current Adjustment (See Figs. 1-1 and 1-2)

- Conditions:
1. INPUT SELECTOR CD
 2. SPEAKERS load 8 Ohms
 3. Input a 20 kHz sine wave from an oscillator to the CD input terminal, output 35 W (16.8V) at a load of 8 Ohms for five minutes to preheat, and then adjust the VOLUME to minimum.

STEP	SUBJECT	MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
1	Bias current adjustment (HOT amp)	Connect a DC voltmeter between ⑤ and ⑥ shown in Fig. 1-2 (both ends of R68) on the HOT side of the left channel. Connect for the right channel in the same way.	KVR3 (F-6160)	DC 5mV \pm 1mV	* Set the SOURCE DIRECT OPERATION switch to SOURCE.
2	Bias current adjustment (COLD amp)	Connect a DC voltmeter between ⑤ and ⑥ shown in Fig. 1-2 (both ends of R71) on the COLD side of the left channel. Connect for the right channel in the same way.	KVR4 (F-6160)	DC 5mV \pm 1mV	* After performing this adjustment (bias current), repeat adjustments 1-1 and 1-2.

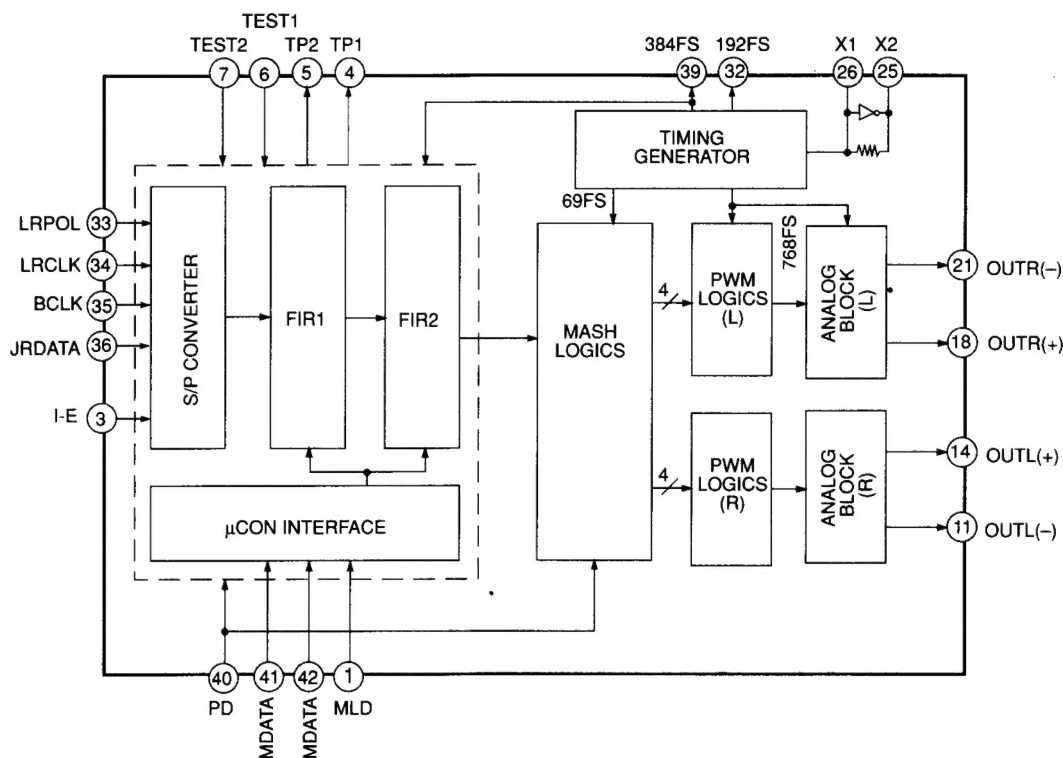
2. BLOCK DIAGRAM



3. INTERIOR BLOCK DIAGRAM & TERMINAL FUNCTION OF IC

• MN 6623DM/MN6471DM (16-BIT D/A Converter)

<Block Diagram>



<Function>

Pin No.	Pin Name	Function	Pin No.	Pin Name	Function
1	MLD	Microcomputer command load input (load when at \odot)	22	AV _{DD} 1	Analog system power source terminal 1 (+5 V)
2	RSTB	Reset terminal (active when at \odot)	23	DV _{DD} 1	Digital system power source terminal 1 (+5 V)
3	IE	When at \odot — Signal processor LSI format When at \oplus — I ² S format	24	DV _{SS} 1	Digital system ground terminal 1
4	TP1	Digital filter test output terminal 1	25	X2	X'tal oscillation terminal
5	TP2	Digital filter test output terminal 2	26	X1	X'tal oscillation terminal
6	TEST 1	Digital filter inspection test signal input terminal 1	27	NC	Not connected
7	TEST 2	Digital filter inspection test signal input terminal 2	28	DV _{DD} 2	Digital system power source terminal 2 (+5 V)
8	NC	Not connected	29	DV _{SS} 2	Digital system ground terminal 2
9	NC	Not connected	30	NSUB	Connected to D-V _{DD} (silicone PCB potential stabilizer terminal)
10	AV _{DD} 4	Analog system power source terminal 4 (+5 V)	31	NC	(See note)
11	OUTL (-)	Left channel antiphase PWM output terminal	32	192FS	192 FS (=8.4672 MHz) output terminal
12	AV _{SS} 4	Analog system ground terminal 4	33	LRPOL	Left/right channel switching terminal (\oplus is left channel, \odot is right channel)
13	AV _{SS} 3	Analog system ground terminal 3	34	LRCLK	LRCLK input terminal LR-POL when at \oplus : \oplus is left channel data input, \odot is right channel data input LR-POL when at \odot : \oplus is right channel data input, \odot is left channel data input
14	OUTL (+)	Left channel normal phase PWM output terminal	35	BCLK	Serial input bit clock
15	AV _{DD} 3	Analog system power source terminal 3 (+5 V)	36	SRDATA	Serial input data (digital) input terminal
16	NC	Not connected	37	DV _{SS} 3	Digital system ground terminal 3
17	AV _{DD} 2	Analog system power source terminal 2 (+5 V)	38	DV _{DD}	Digital system power source terminal (COM potential stabilizer terminal)
18	OUTR (+)	Right channel antiphase PWM output terminal	39	384FS	384 FS (16.9344 MHz) output terminal
19	AV _{SS} 2	Analog system ground terminal 2	40	PD	Power down terminal (\odot is active)
20	AV _{SS} 1	Analog system ground terminal 1	41	MDATA	Microcomputer command data input terminal
21	OUTR (-)	Right channel normal phase PWM output terminal	42	MCLK	Microcomputer command clock input terminal

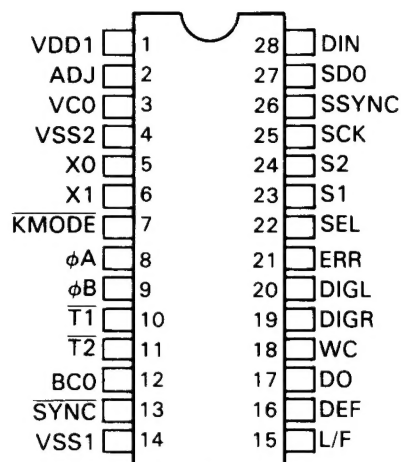
Note: Since the output terminal is always at H, care must be taken not to touch the ground.

• YM3623B (Reception and playback of digital audio interface format signals)

<Functional Outline>

- 1) The YM3623B is equipped with internal PLL circuit, which syncs with digital audio format signals from an external source. As a result, it automatically adjusts to the sampling frequency.
- 2) Audio signals are output MSB first. The timing clock for D/A output sample holding and the L and R channel identifier symbols are output in sync with these audio signals.
- 3) The YM3623B is equipped with a terminal for outputting sub codes, thereby enabling the extraction of sub codes.
- 4) Sampling frequency, copy-enable, emphasis-existence, and the existence of errors in the transmitted audio signals can be output.
- 5) If an error is detected in the digital audio interface format signals, the preceding audio data is output again.

Pin No.	Pin Name	I/O	Function
1	VDD1	—	System power supply (+5V)
2	ADJ	I	VCO oscillation frequency adjusting terminal (not connected)
3	VCO	I/O	External capacitor terminal for VCO circuit.
4	VSS2		GND for VCO circuit. Connect in common with VSS1 (this connection is not made in the LSI).
5	XO	O	Quartz oscillator terminal (16.9344 MHz)
6	XI	I	Quartz oscillator terminal
7	KMODE	I(PU)	H: PLL circuit functions on input to DIN terminal. If there is no input, quartz oscillator is used. L: Quartz oscillator is used regardless of DIN terminal.
8	φA	O	16.9344MHz when quartz oscillator used; Varies according to speed of data input to DIN terminal when PLL circuit used. (fs=44.1kHz, about 16.9344MHz)
9	φB	O	φA divided by 3 when quartz oscillator used. Varies according to speed of data input to DIN terminal when PLL circuit used. (fs=44.1kHz, about 5.6448MHz)
10	T1	I(PU)	Internal circuit check terminal
11	T2	I(PU)	Internal circuit check terminal
12	BCO	O	Timing for signal output from DO terminal
13	SYNC	O	Sync signal
14	VSS1	O	System GND (+0V)
15	L/R	O	Indicates that data from L channel (when H) or R channel (when L) is output from DO terminal
16	DEF	O	H: Indicates that emphasis is applied to input data L: Indicates that emphasis is not applied to input data
17	DO	O	16-bit data output
18	WC	O	Indicates that data is output to DO terminal.
19	DIGR	O	Signal for deglitching R channel.



• Function <YM3623B>

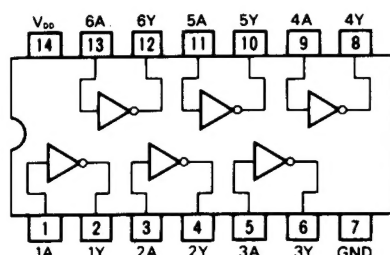
Pin No.	Pin Name	I/O	Function
20	DIGL	O	Signal for deglitching L channel.
21	ERR	O	H: Parity error or operating using quartz oscillator L: No error
22	SEL	I (PU)	*See separate note
23	S1	O	*See separate note
24	S2	O	*See separate note
25	SCK	O	Sub-code output clock
26	SSYNC	O	Signal for sub-code input
27	SDO	O	Terminal for outputting sub-code data
28	DIN	I (PU)	Data input terminal.

*Output functions of terminals S1 and S2 are multiplexed.
*S1/S2 terminal output can be switched by switching SEL terminal input.

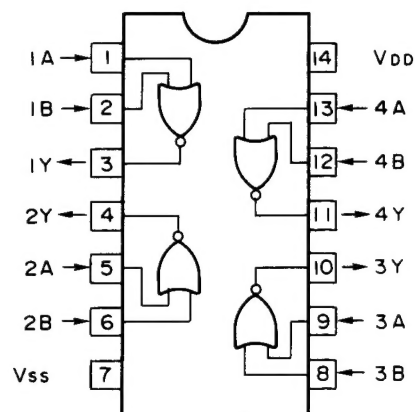
Input		Output	Output	
SEL	S1	Function	S2	Function
L	L	Copy-disable	L	CD (excluding DAT)
	H	Copy-enable	H	DAT
H	L	—	L	Sampling frequency of DIN input terminal: 44.1 kHz
	L	—	H	48 kHz
	H	—	H	32 kHz
	H	—	L	—

The required data is extracted from the digital audio interface format signals input as above and output to S1 and S2.

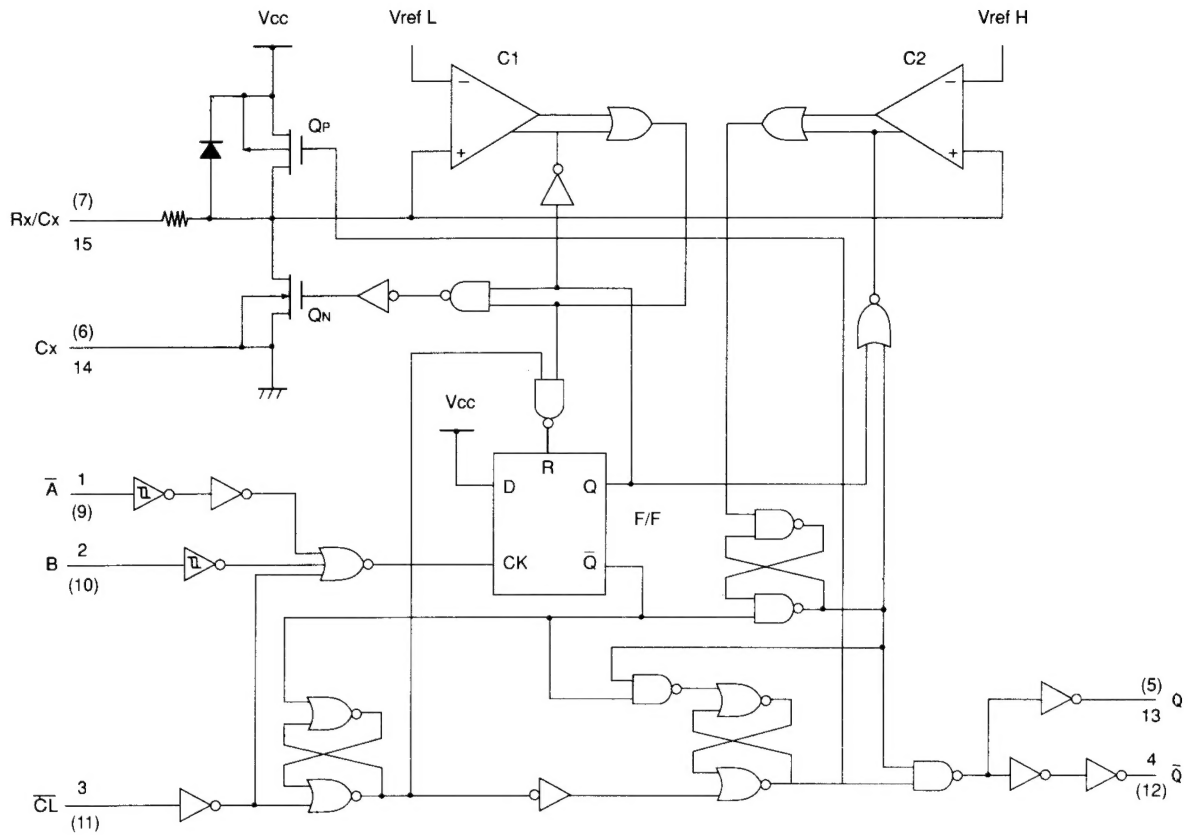
• TC74HC04 <Inverter>



• TC4001P <NOR Gate>



• TC74HC123P <Dual Monostable Multivibrator>

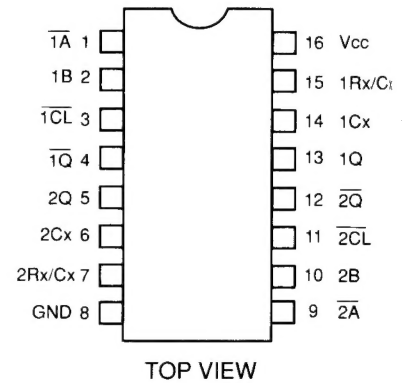


Note: Pin terminals in parentheses are for channel 2.

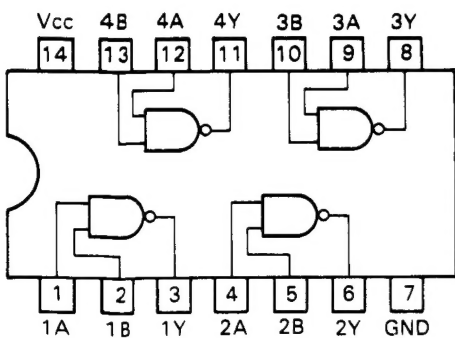
Function <TC74HC123P>

INPUTS			OUTPUTS		NOTE
\bar{A}	B	CL	Q	\bar{Q}	
	H	H			OUTPUT ENABLE
X	L	H	L	H	INHIBIT
H	X	H	L	H	INHIBIT
L		H			OUTPUT ENABLE
L	H				OUTPUT ENABLE
X	X	L	L	H	INHIBIT

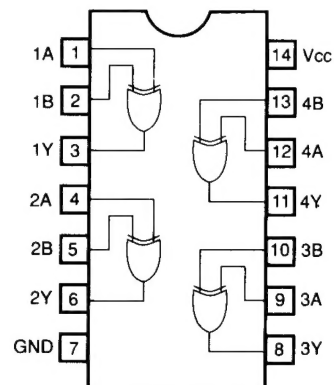
X: Don't Care



• TC74HC00AP <NAND Gate>

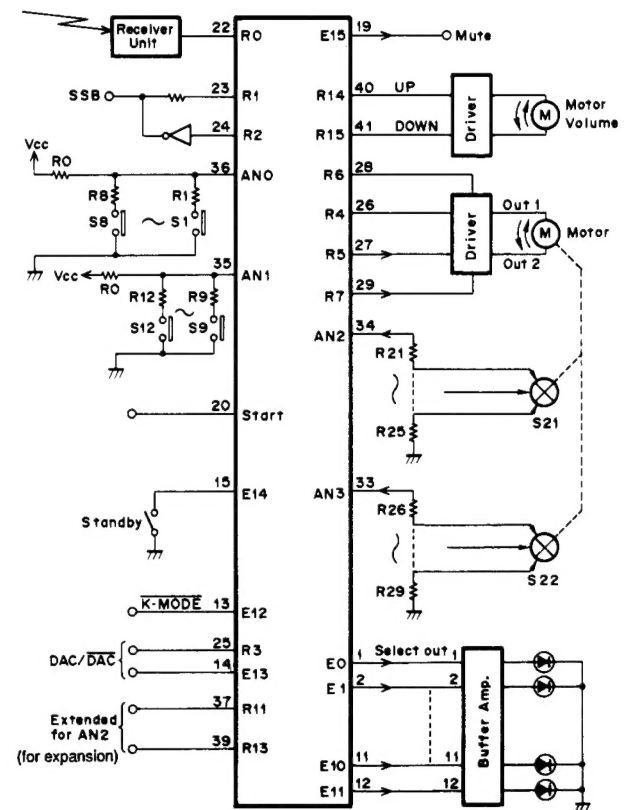


TC74HC86P <Quad Exclusive-OR Gate>

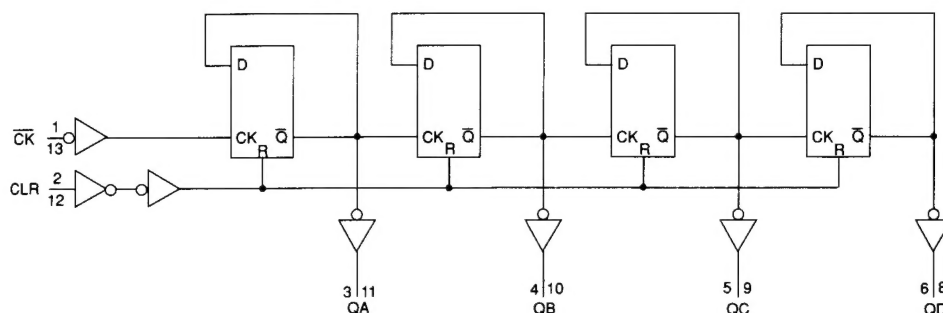


• MB88513P-187N <E.R.S. Microcomputer>

Pin No.	Pin Name	Function	Active
1	Select out 1	Selector switch output terminal (DIGITAL 1)	L
2	Select out 2	Selector switch output terminal (DIGITAL 2)	L
3	Select out 3	Selector switch output terminal (DIGITAL 3)	L
4	Select out 4	Selector switch output terminal (DIGITAL 4)	L
5	Select out 5	Selector switch output terminal (CD)	L
6	Select out 6	Selector switch output terminal (LINE)	L
7	Select out 7	Selector switch output terminal (TUNER)	L
8	Select out 8	Selector switch output terminal (PHONO)	L
9	Select out 9	Selector switch output terminal (SOURCE)	L
10	Select out 10	Selector switch output terminal (TAPE 1)	L
11	Select out 11	Selector switch output terminal (TAPE 2)	L
12	Select out 12	Selector switch output terminal (TAPE 3)	L
13	KMODE	Power on delay terminal. To KMODE of IC YM3623	L
14	DAC/DAC	DAC selection output terminal. H when pin 25 is H, selector operates when L. S1-S4 L S5-S12 H	—
15	Stand-by	Stand-by determined. Yes ... H, No ... L	—
19	Mute	Mute signal output terminal	H
20	Start	Wake up set terminal	H
22	REM	Remote control signal input terminal	L
25	DAC/DAC	DAC selector input terminal. DAC ... L, No DAC ... H	—
26	MOTR SW	Motor switch control terminals	H
27			
28			
29			
32	A-Vcc	+5 V power source terminal	—
33	M SEN	Motor switch position detector input terminals	—
34			
35	INPUT SEL	Input selector switch input terminal. SOURCE, TAPE 1, TAPE 2, TAPE 3	—
36	INPUT SEL	Input selector switch input terminal. PHONO, TUNER, LINE, CD	—
37	D MUTE	DIGITAL REC OUT MUTE. DIGITAL 4 and SOURCE ... L	L
40	MOTOR VR	Motor volume UP/DOWN output terminals	H
41			
42	Vcc	+5 V power source terminal	—



• TC74HC393P <Dual Binary Counter>



Function <TC74HC393P>

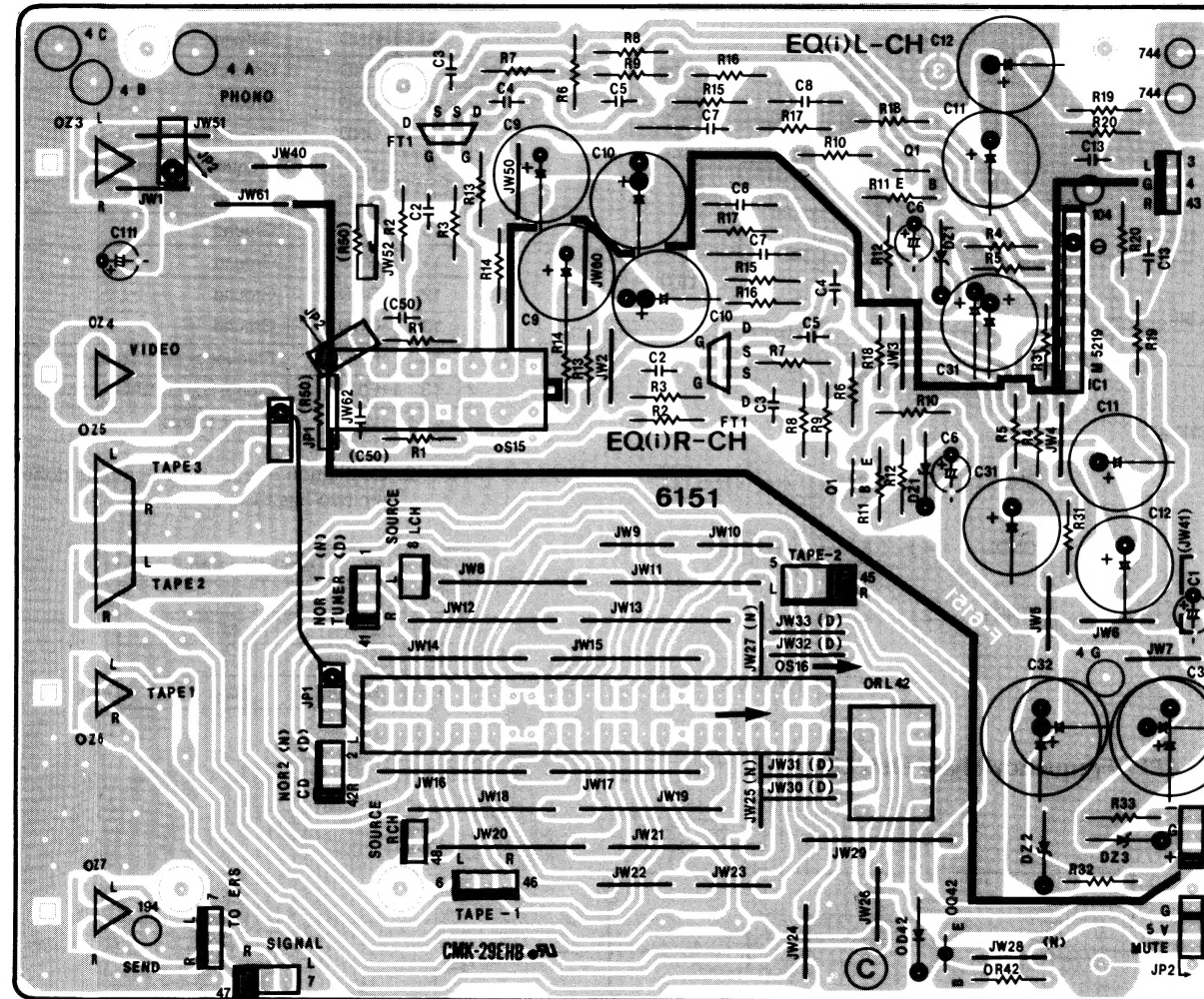
INPUT		OUTPUT			
CK	CLR	QA	QB	QC	QD
X	H	L	L	L	L
↓	H	COUNT UP			
↑	H	NO CHANGE			

X: Don't Care

4. PARTS LOCATION ON BOARD

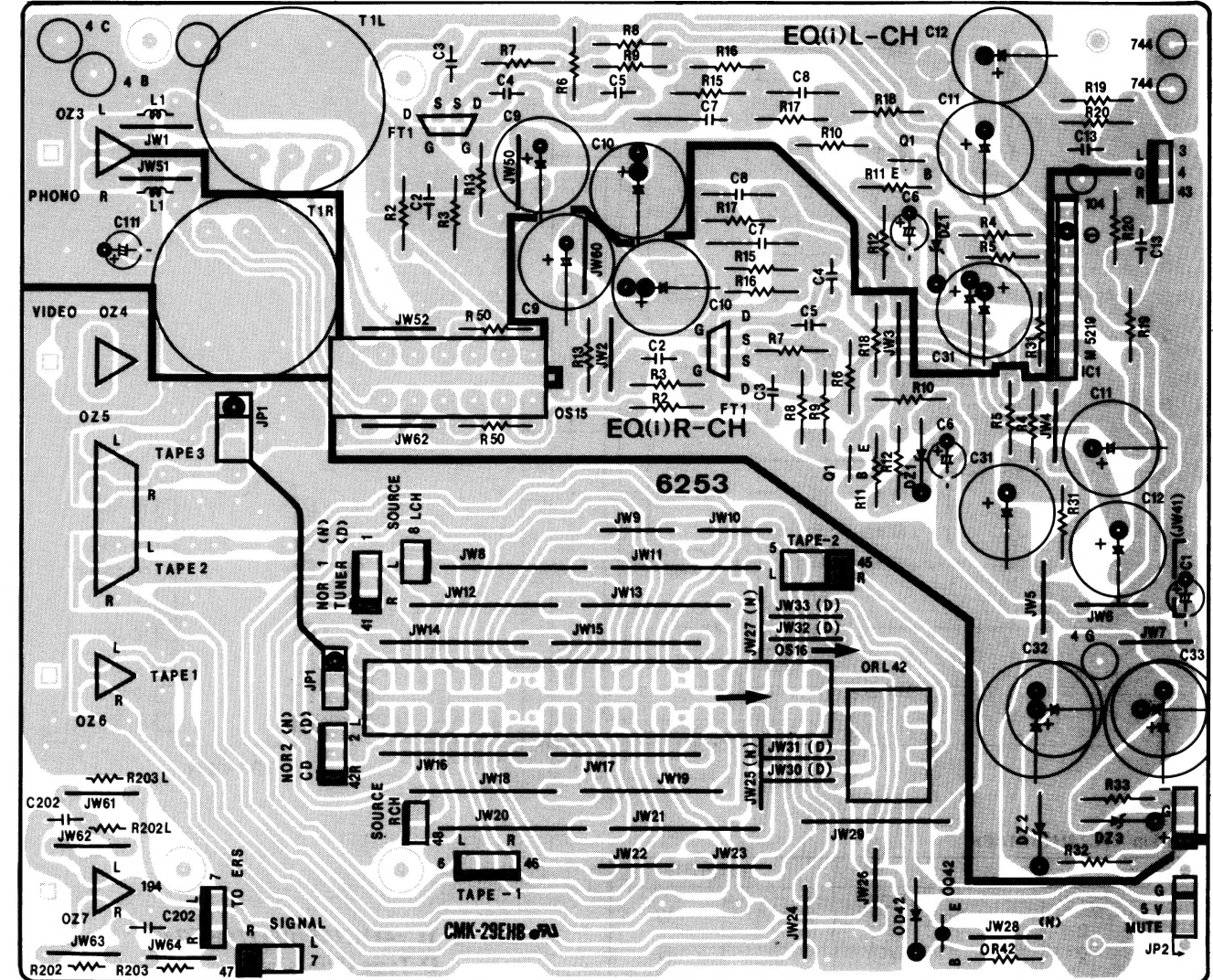
4-1. F-6151 TAPE(REC), VIDEO, SEND Terminal and EQ AMP Board <XX, SS>

Component Side



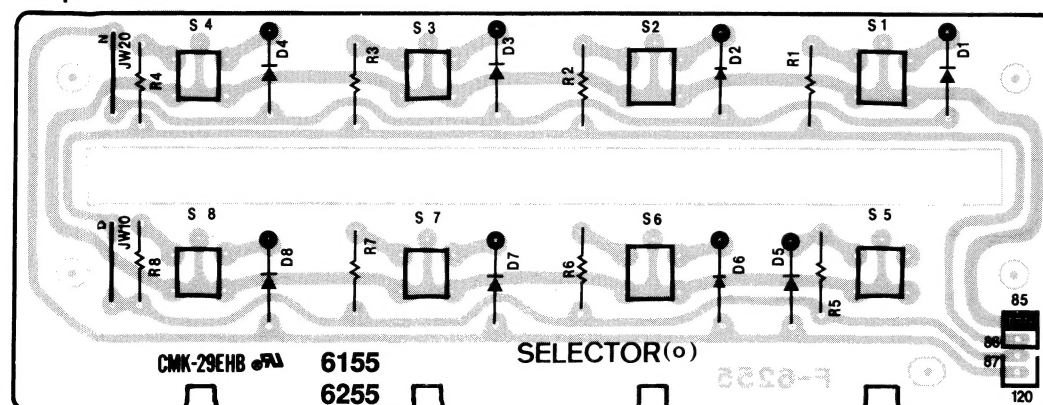
4-3. F-6253 TAPE(REC), VIDEO, SEND Terminal and EQ AMP Board <EU, EG>

Component Side



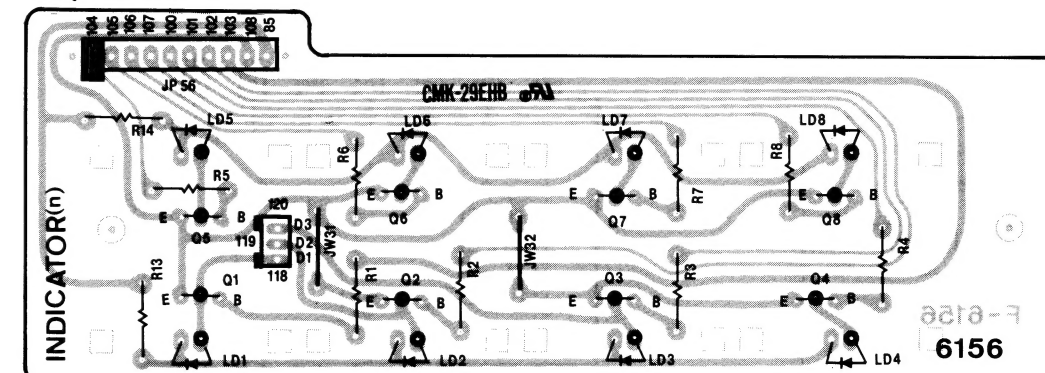
4-2. F-6155 Input Changeover Switch Board <XX, SS> F-6255 Input Changeover Switch Board <EU, EG>

Component Side



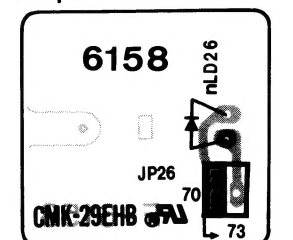
4-4. F6156 Input Indicator Board

Component Side

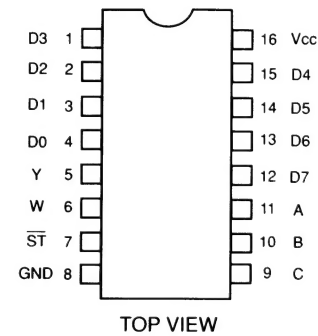
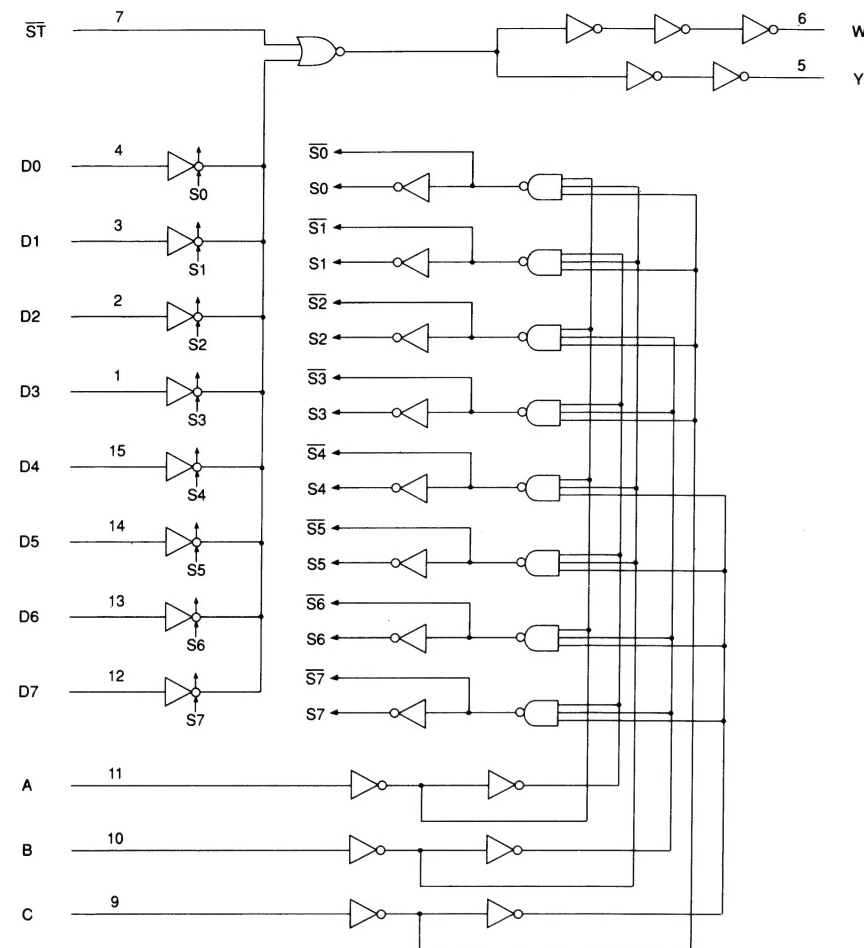


4-5. F-6158 NORMAL AMP Indicator Board

Component Side



- **TC74HC151AP <8-channel Multiplexer>**

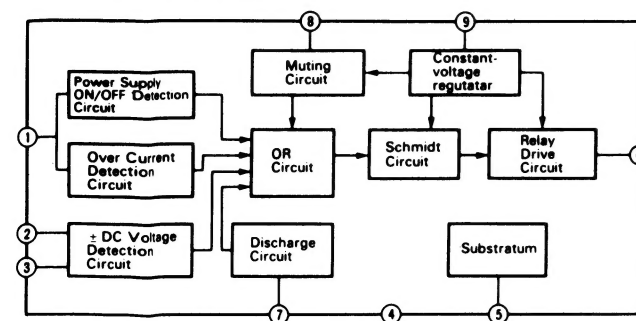


Function <TC74HC151AP>

INPUTS				OUTPUTS	
SELECT			STROBE	Y	W
C	B	A	\overline{ST}		
X	X	X	H	L	H
L	L	L	L	D0	$\overline{D0}$
L	L	H	L	D1	$\overline{D1}$
L	H	L	L	D2	$\overline{D2}$
L	H	H	L	D3	$\overline{D3}$
H	L	L	L	D4	$\overline{D4}$
H	L	H	L	D5	$\overline{D5}$
H	H	L	L	D6	$\overline{D6}$
H	H	H	L	D7	$\overline{D7}$

X: Don't Care

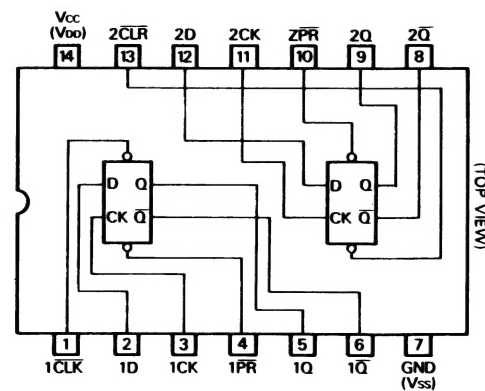
- **TA7317P <Protector>**



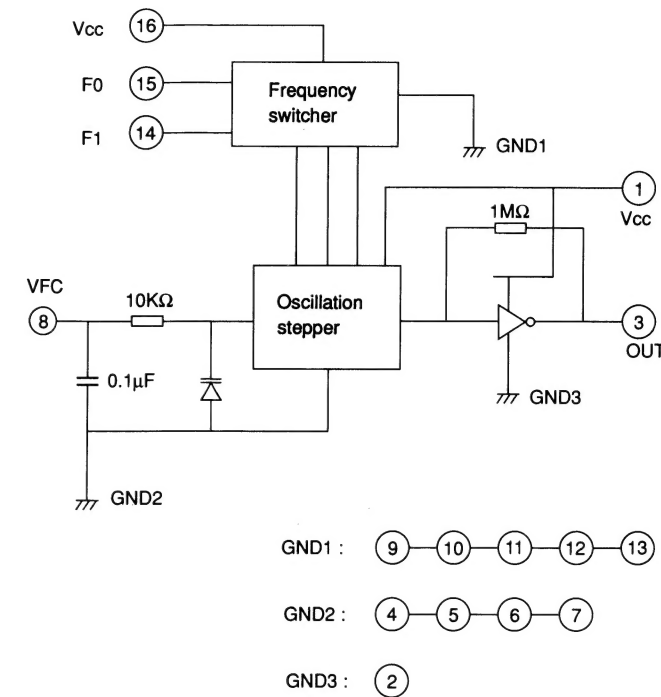
- **TC74HC74P/μPD74HC74C**
D-Type (Flip-Flop)

INPUTS				OUTPUTS		FUNCTION
CLR	PR	D	CK	Q	\bar{Q}	
L	H	X	X	L	H	CLEAR
H	L	X	X	H	L	RESET
L	L	X	X	H	H	—
H	H	L		L	H	—
H	H	H		H	L	—
H	H	X		\bar{Q}_n	\bar{Q}_n	NO CHANGE

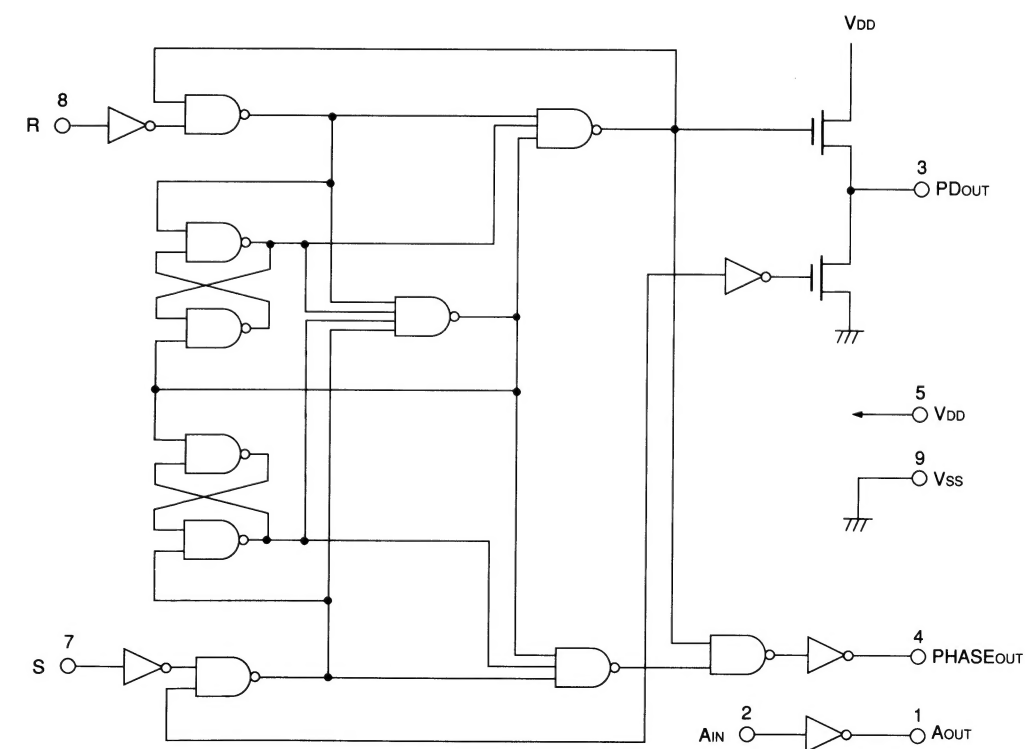
X : Don't Care



• FAR-M2SC-18M432-D300 <Variable V.C.O.>



• TC5081P <PLL Frequency Phase Detector>



Function <FAR-M 2SC-18M432-D300>

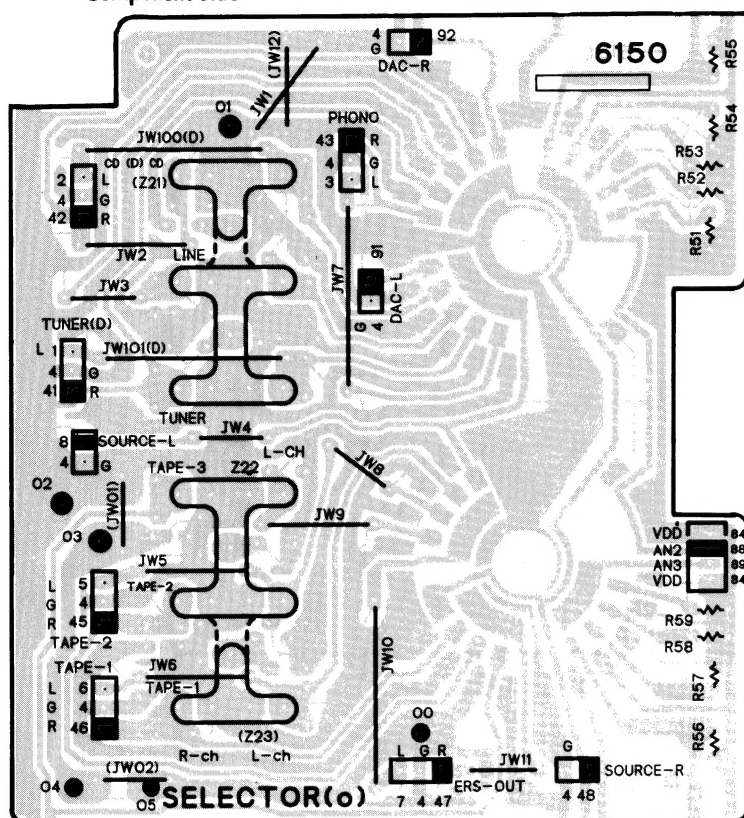
Pin No.	Pin Name	Function
1	V _{cc}	Power source
2	GND	Ground
3	OUTPUT	Output
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	V _{fc}	Frequency control
9	GND	Ground
10	GND	Ground
11	GND	Ground
12	GND	Ground
13	GND	Ground
14	F1	Frequency switching terminal (Note 2)
15	F0	Frequency switching terminal (Note 2)
16	V _{cc}	Power source

Note 2: Oscillation frequency switching is done with the two bits F1 and F0.

F1	F2	Oscillation frequency
H	H	L
L	L	M
H	L	H
L	H	Stop

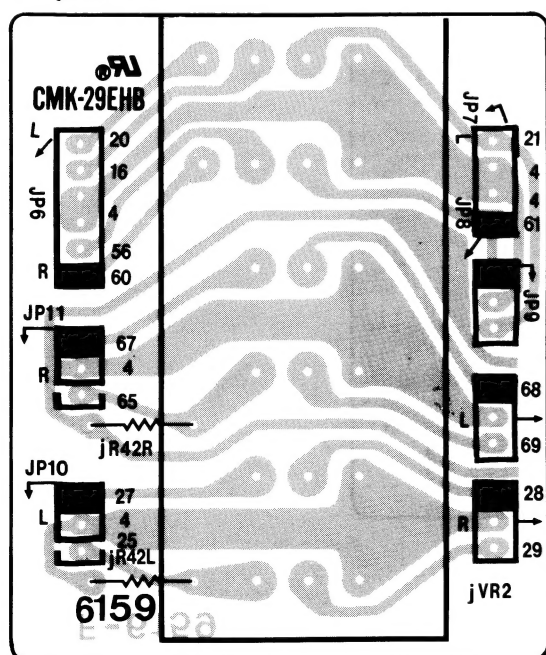
4-6. F-6150 Input Terminal and E.R.S. Board

Component Side



4-7. F-6159 Volume Board

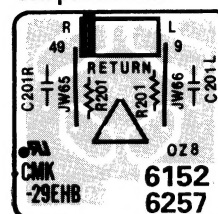
Component Side



4-8. F-6152 RETURN Terminal Board <XX, SS>

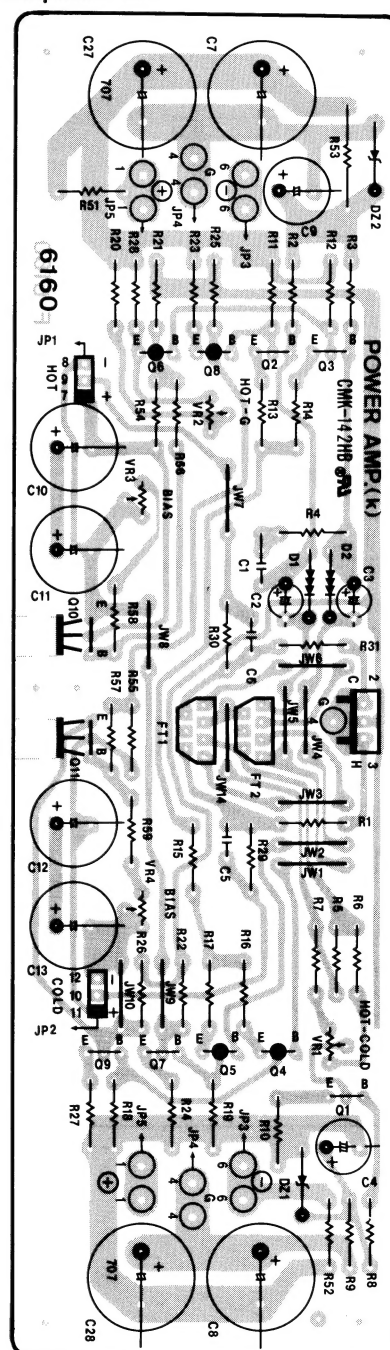
F-6257 RETURN Terminal Board <EU, EG>

Component Side



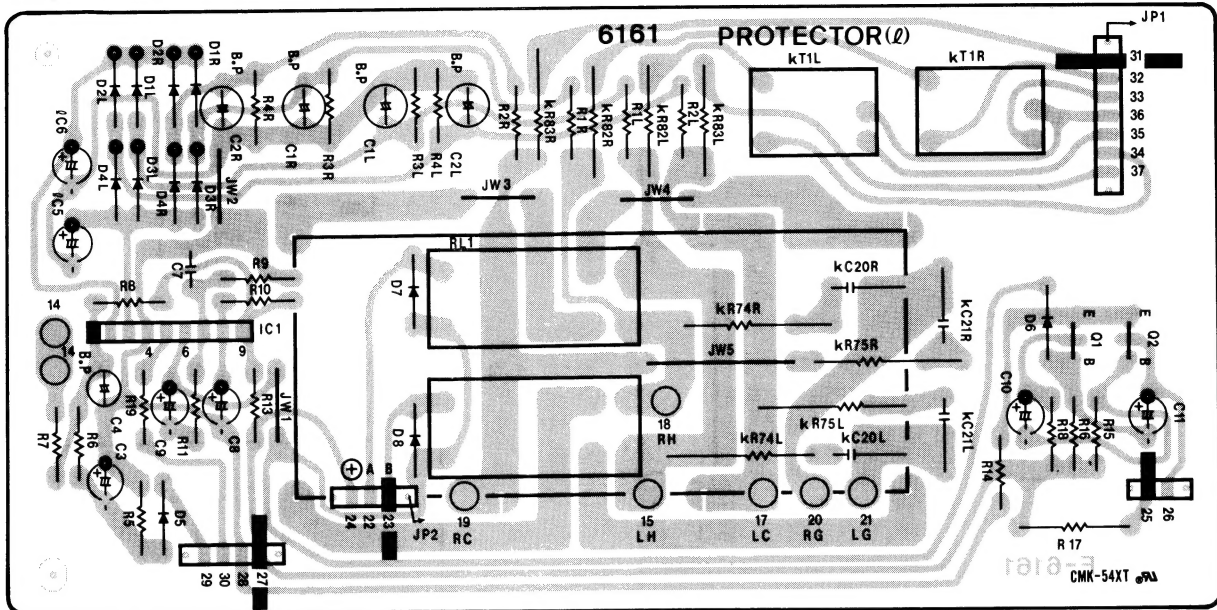
4-9. F-6160 Driver AMP Board

Component Side



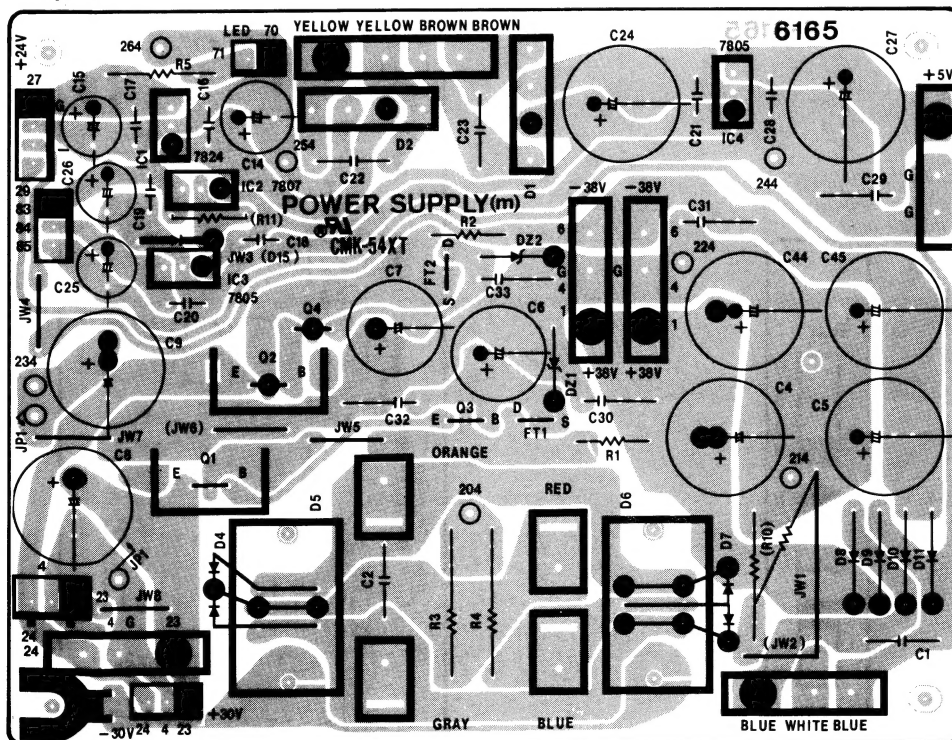
4-10. F-6161 Protector Board

Component Side



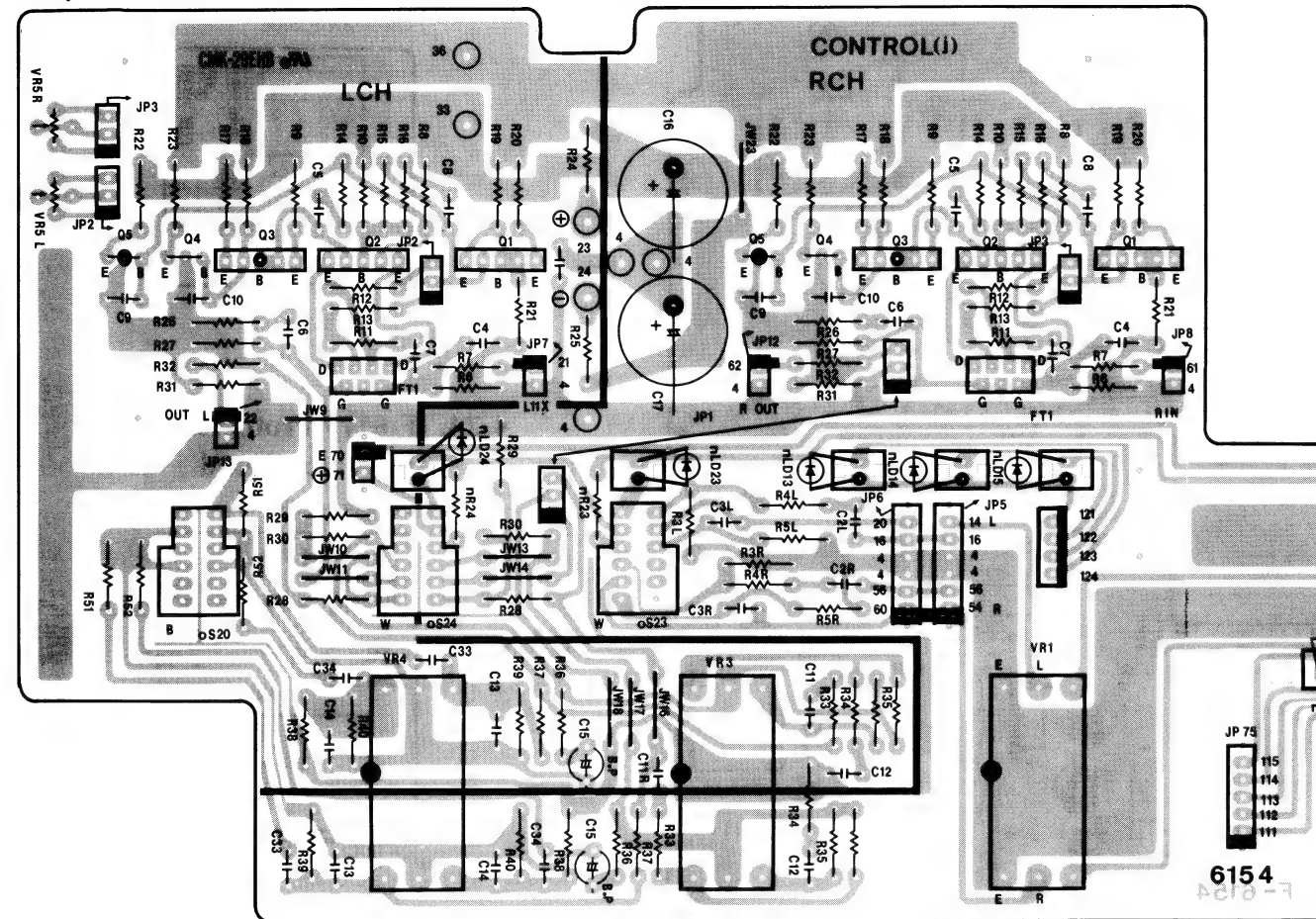
4-11. F-6165 Power Supply Board

Component Side



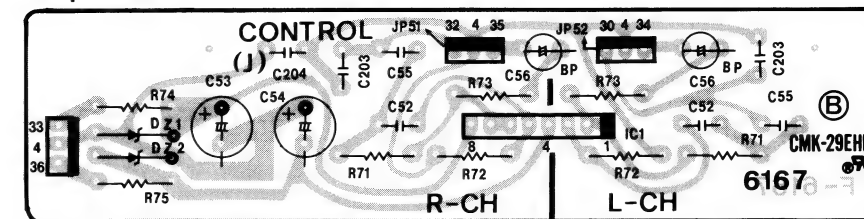
4-12. F-6154 Control AMP Board

Component Side



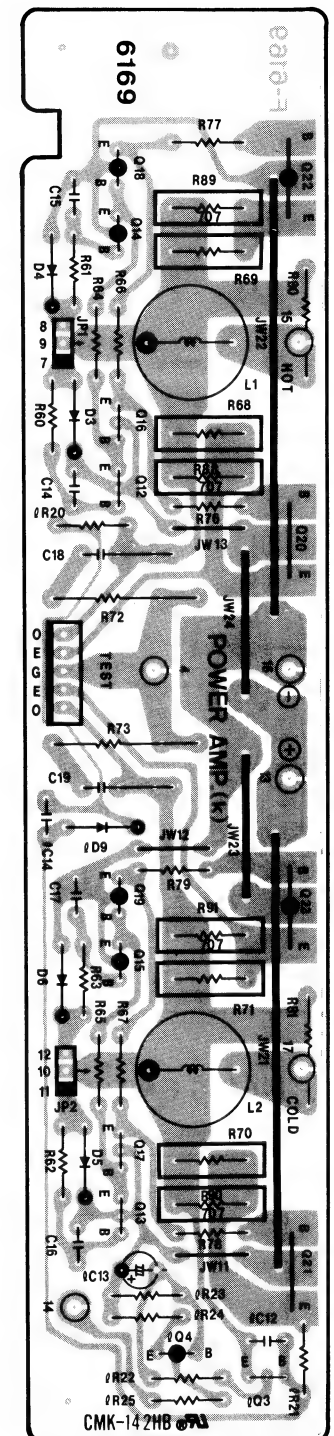
4-17. F-6167 Tone Control Board

Component Side



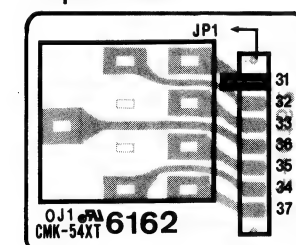
4-19. F-6169 Power AMP Board

Component Side



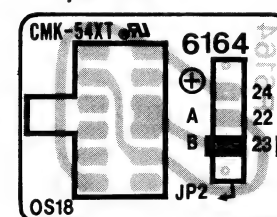
4-13. F-6162 PHONES Jack Board

Component Side



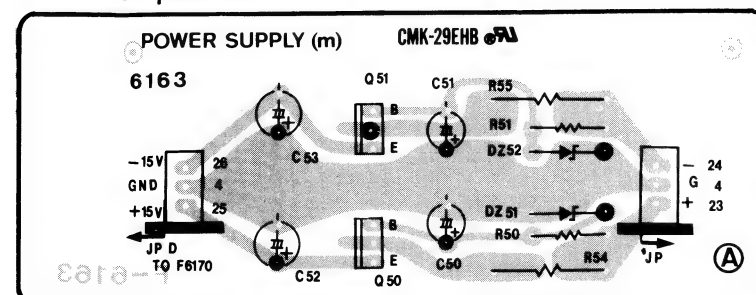
4-15. F-6164 SPEAKERS Switch Board

Component Side



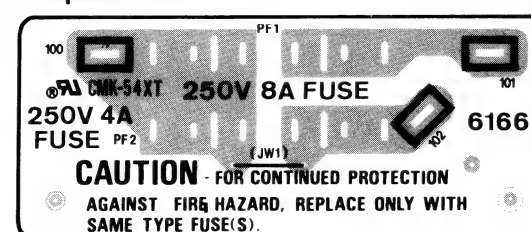
4-14. F-6163 D/A Converter Power Supply Board

Component Side



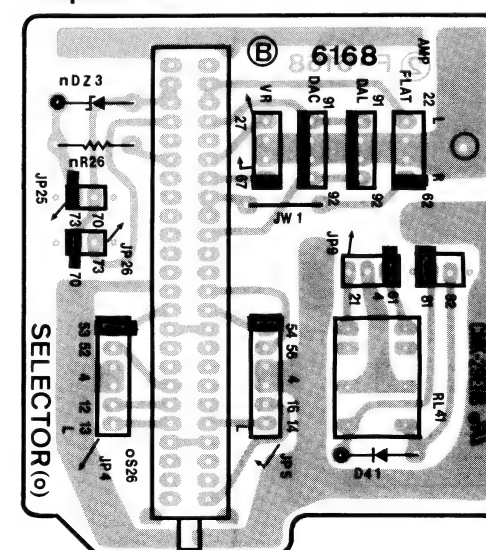
4-16. F-6166 Power Fuse Board

Component Side



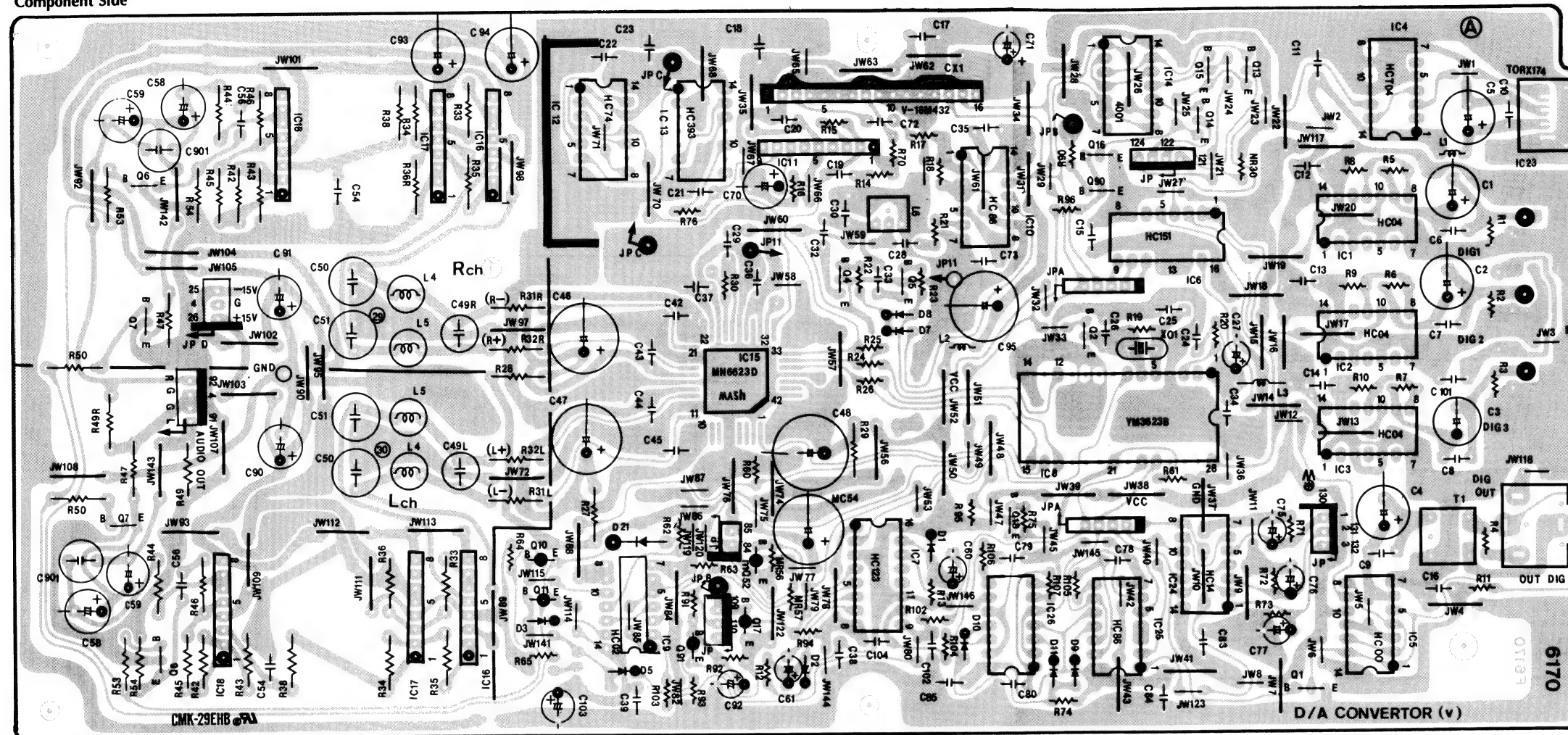
4-18. F-6168 SOURCE DIRECT OPERATION Switch Board

Component Side



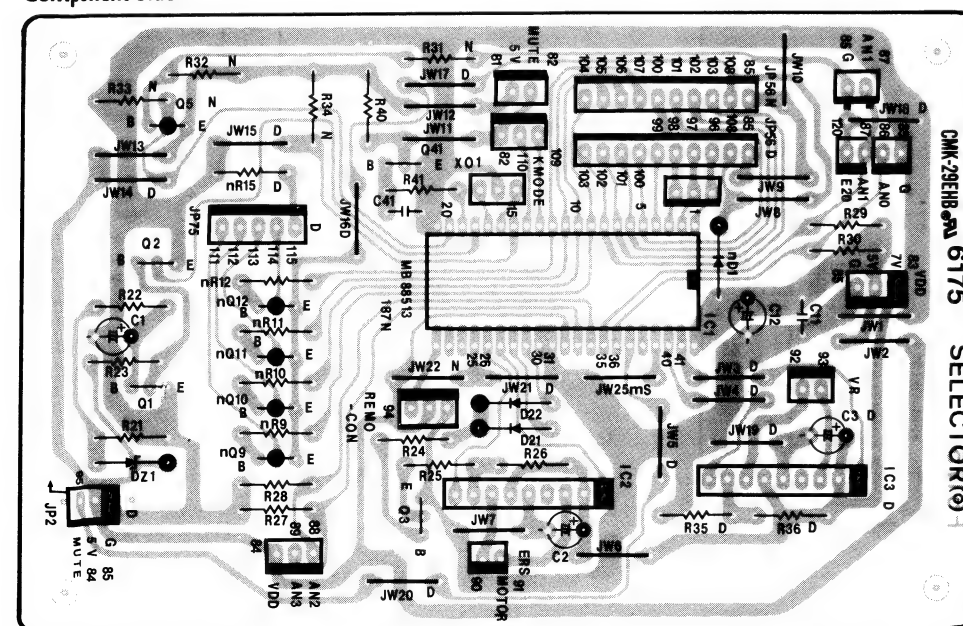
4-20. F-6170 D/A Converter Board

Component Side



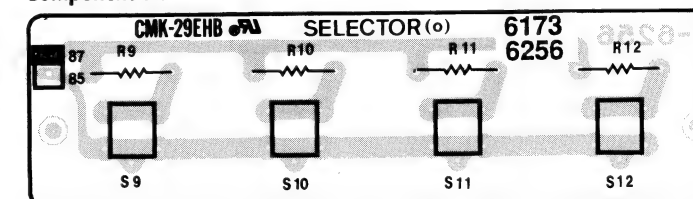
4-21. F-6175 E.R.S. Control IC Board

Component Side



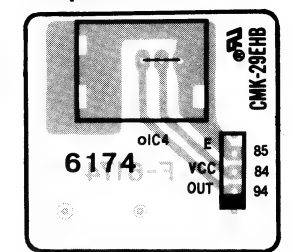
4-22. F-6173 SOURCE, TAPE1, 2, 3, Switch Board <XX, SS> F-6256 SOURCE, TAPE1, 2, 3, Switch Board <EU, EG>

Component Side



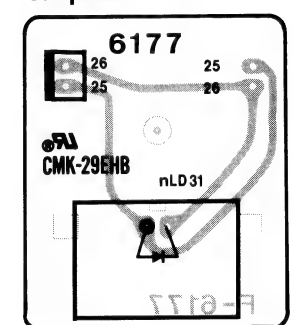
4-23. F-6174 Remote Controller Receive Board

Component Side



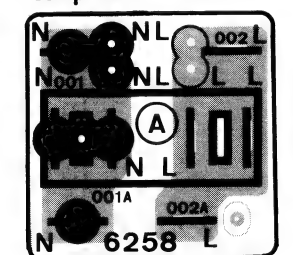
4-24. F-6177 Protector Indicator Board

Component Side



4-25. F-6258 Connection Board

Component Side



5. PARTS LIST OF BOARD

1. Some printed circuit board are not supplied assembled.
To separate these in this Parts list, the stock numbers are not indicated for these boards. However, stock numbers for individual parts are indicated.
2. Since some capacitors and resistors are omitted from parts lists in this Parts List, refer to the Common Parts List for capacitors and resistors, which was issued on June 1987.
3. Abbreviations in this Parts List are as follows.

5-1. F-6150 Input terminal and E.R.S. Rotary Ass'y Board

Parts No.	Stock No.	Description
	49359700	2P Terminal, CD
	49359800	4P Terminal, LINE, TUNER
	49359900	6P Terminal, TAPE 1~3 (PLAY)
	00458000	Flange Head Screw, M3x8
	00420500	Binding Head Screw M2x4
	46911800	Washer Head Screw

Caution: These code numbers for the board assembly are only for the board and rotary switch; code numbers for the motor and other drive parts are not included. The parts list and exploded view for the E.R.S. are given on page 24.

5-2. F-6151 TAPE(REC), VIDEO, SEND Terminal and EQ AMP Board

<Stock No. 01186201=XX, SS>

F-6253 TAPE (REC), VIDEO, SEND Terminal and EQ AMP Board

<Stock No. 01189205=EU, EG>

Parts No.	Stock No.	Description
•Transistor iQ1	46581701	2SC1845
•FET iFT1	46723601	2SK389-BL
	or 46723602	2SK389-V
•IC iIC1	46579100	M5219L
•Zener Diode iDZ1	46825200	RD6.2E-B1
	or 49303400	05AZ6.2-Z
iDZ2, 3	49307200	05AZ20-R
	or 49307300	05AZ22-X
Δ iR32, 33	46229700	390Ω 1/2W N.I.R.
iT1	48828200	MC Head Transformer <EU, EG>
•Transistor oQ42	46367001	2SA1115
•Diode oD42	03117600	1S2473T77
	or 46086000	1S1588TP-3

•Abbreviations List

C.R.	: Carbon Resistor	E.B.L	: Low Leak Bi-Polar Electrolytic Capacitor
S.R.	: Solid Resistor	Ta.C.	: Tantalum Capacitor
Ce.R.	: Cement Resistor	F.C.	: Film Capacitor
M.R.	: Metal Film Resistor	M.P.	: Metalized Paper Capacitor
F.R.	: Fusing Resistor	P.C.	: Polystyrene Capacitor
N.I.R.	: Non-Inflammable Resistor	M.M.C.	: Metalized Mylar Capacitor
A.R.	: Array Resistor	A.C.	: Array Capacitor
C.C.	: Ceramic Capacitor	V.R.	: Variable Resistor
C.T.	: Ceramic Capacitor, Temperature Compensation	S.V.R.	: Semi Variable Resistor
E.C.	: Electrolytic Capacitor	SW.	: Switch
E.L.	: Low Leak Electrolytic Capacitor	Chip R.	: Chip Resistor
E.B.	: Bi-Polar Electrolytic Capacitor	Chip C.	: Chip Capacitor

<F-6151>

Parts No.	Stock No.	Description
oS15	07199301	Push SW., MM/MC
oS16	48164000	Slide SW., REC SELECTOR
oRL42	49375400	Relay
	48791800	2P Terminal, SEND, TAPE-1,
	48792100	2P Terminal, PHONO
	49360600	2P Terminal, VIDEO
	48791900	4P Terminal, TAPE-2, 3

5-3. F-6152 RETURN Input Terminal Board <XX, SS>

F-6257 RETURN Input Terminal Board <EU, EG>

Parts No.	Stock No.	Description
	48528100	2P Terminal Board

5-4. F-6154 Control AMP Board

<Stock No. 01186701>

Parts No.	Stock No.	Description
•Transistor jQ1, 2	03068801	2SC2291
jQ3	03011901	2SA995
jQ4	46581701	2SC1845
jQ5	46581601	2SA992
•FET jFT1	46723601	2SK389-BL
	or 46723602	2SK389-V
	or 48785701	2SK389-BK
	or 48785702	2SK389-VK
Δ jR19, 20	46229100	120Ω 1/2W N.I.R.
Δ jR21	46231100	56Ω 1/2W N.I.R.
Δ jR24, 25	46229000	100Ω 1/2W N.I.R.

to be continued

<F-6154>

Parts No.	Stock No.	Description
jC4	49424500	33pF 125V F.C.
jC5	49425900	470pF 125V F.C.
jC14	48479800	0.33μF 63V F.C.
jC15	48102500	10μF 25V E.B.
jVR1	49381400	250Kx2Ω V.R., BALANCE
jVR3	48669000	100Kx2 V.R., TREBLE
jVR4	48669000	100Kx2 V.R., BASS
jVR5	49392200	100Ω S.V.R., DC0V
•Zener Diode		
nDZ2, 4	49301400	05AZ3.3-X
or	49301500	05AZ3.3-Z
nLD9	48841300	SEL3813A, SOURCE
nLD10	48841300	SEL3813A, TAPE-1/DAT
nLD11	48841300	SEL3813A, TAPE-2
nLD12	48841300	SEL3813A, TAPE-3
nLD13	48841100	SEL3210S, 32kHz
nLD14	48841100	SEL3210S, 44kHz
nLD15	48841100	SEL3210S, 48kHz
nLD21	48904700	SEL3810A, MUTING
nLD22	48904700	SEL3810A, SUBSONIC
nLD23	48904700	SEL3810A, LOUDNESS
nLD24	48904700	SEL3810A, TONE
nLD25	48904700	SEL3810A, PROCESSOR
oS21	49386200	Push SW., MUTING
oS22	49386100	Push SW., SUBSONIC
oS23	49386200	Push SW., LOUDNESS
oS24	49386200	Push SW., TONE
oS25	49386100	Push SW., PROCESSOR

5-5. F-6155 Input Changeover Switch Board <XX, SS> F-6255 Input Changeover Switch Board <EU, EG>

Parts No.	Stock No.	Description
oR1	49366200	39kΩ 1/4W C.R.
oR2	49365900	30kΩ 1/4W C.R.
oR3	49365700	24kΩ 1/4W C.R.
oR4	49365500	20kΩ 1/4W C.R.
oR5	49364100	5.1kΩ 1/4W C.R.
oR6	49364300	6.2kΩ 1/4W C.R.
oR7	49364500	7.5kΩ 1/4W C.R.
oR8	49364700	9.1kΩ 1/4W C.R.
oS1	48838300	Push SW., DIGITAL-1
oS2	48838300	Push SW., DIGITAL-2
oS3	48838300	Push SW., DIGITAL-3
oS4	48838300	Push SW., DIGITAL-4 (OPTICAL)
oS5	48838300	Push SW., PHONO
oS6	48838300	Push SW., TUNER
oS7	48838300	Push SW., LINE
oS8	48838300	Push SW., CD

5-6. F-6156 Input Indicator Board <Stock No. 01186301>

Parts No.	Stock No.	Description
•Transistor		
nQ1~8	46367001	2SA1115

<F-6156>

Parts No.	Stock No.	Description
nLD1	48841300	SEL3813A, DIGITAL-1
nLD2	48841300	SEL3813A, DIGITAL-2
nLD3	48841300	SEL3813A, DIGITAL-3
nLD4	48841300	SEL3813A, DIGITAL-4
nLD5	48841300	SEL3813A, PHONO
nLD6	48841300	SEL3813A, TUNER
nLD7	48841300	SEL3813A, LINE
nLD8	48841300	SEL3813A, CD

5-7. F-6158 Normal AMP Indicator Board

Parts No.	Stock No.	Description
nLD26	48841100	SEL3210S

5-8. F-6159 Master Volume Board

Parts No.	Stock No.	Description
jVR2	49359100	100KΩ+5KΩ V.R.

5-9. F-6160 Driver AMP Board <Stock No. 01187601>

Parts No.	Stock No.	Description
•Transistor		
kQ1	46581701	2SC1845
kQ2, 3	46581701	2SC1845
or	46947401	2SC2459
kQ4, 5	46581601	2SA 992
or	46947301	2SA1049
kQ6	46728201	2SA1145
kQ7	46728301	2SC2705
kQ8	46728201	2SA1145
kQ9	46728301	2SC2705
kQ10, 11	46581701	2SC1845
•FET		
kFT1, 2	46723601	2SK389-BL
or	46723602	2SK389-V
or	48785701	2SK389-BK
or	48785702	2SK389-VK
kD1, 2	03104800	Varistor SV-03
or	03401700	Varistor MV103
•Zener Diode		
kDZ1	46825300	RD6.2E-B2
or	49303400	05AZ6.2-Z
kDZ2	03171500	RD22F B
Δ KR51, 52	46228400	33Ω 1/2W N.I.R.
Δ KR53	46250500	1kΩ 1W N.I.R.
kC1	49329700	750pF 100V P.C.
kC5	49423300	4pF 125V P.C.
kC6	49423300	4pF 125V P.C.
kVR1	48700000	100Ω S.V.R., HOT/COLD Balance adj.
kVR2	48700200	500Ω S.V.R., HOT/G Balance adj.
kVR3	48078600	1KΩ S.V.R., Bias adj.
kVR4	48078600	1KΩ S.V.R., Bias adj.

5-10. F-6161 Protector Board

<Stock No. 01187801>

Parts No.	Stock No.	Description
△ kR74, 75	46623100	10Ω 2W N.I.R.
△ kR82, 83	46248700	33Ω 1W N.I.R.
KT1	46841810	Output Transformer
•Transistor IQ1, 2	46188701 or 46367301	2SC1815 2SC2458
•IC IIC1	46207600	TA7317P
•Diode ID1~4	03117600 or 46086000	1S2473T77 1S1588TP-3
ID5	03117700	10E-2
△ IR14, 17	46230000	680Ω 1/2W N.I.R.
ID6	03117600 or 46086000	1S2473T77 1S1588TP-3
ID7, 8	48123600	11E2
IC1	48101900	100μF 10V E.B.
IC2	48101900	100μF 10V E.B.
IC4	48103400	1μF 50V E.B.
IC5, 6	48479200	0.1μF 63V M.M.C.
IC8	48682700	33μF 16V E.C.
IRL1	49358900	Relay, A-System
IRL2	49358900	Relay, B-System
	48592700	8P Terminal, SPEAKERS

5-11. F-6162 Phones Jack Board

Parts No.	Stock No.	Description
oJ1	46078200	Jack

5-12. F-6163 D/A Converter Power Supply Board

Parts No.	Stock No.	Description
•Transistor mQ50	46728901	2SC3298
mQ51	46728801	2SA1306
mR54, 55	46624600	180Ω 2W N.I.R.

5-13. F-6164 Speakers Switch Board

Parts No.	Stock No.	Description
oS18	49381500	Rotary SW., SPEAKERS

5-14. F-6165 Power Supply Board

<Sotck No. 01188101>

Parts No.	Stock No.	Description
•Transistor mQ1	46728901	2SC3298
mQ2	46728801	2SA1306
mQ3	46581701	2SC1845
mQ4	46583901	2SA 992
mQ30	03083901	2SD313
or 48509401		2SD1761
•FET mFT1, 2	46643501 or 46643602	2SK163-K2 2SK177-GR
•IC mIC2	49386000 or 49396000	L78N07 L78M07
mIC3	46359400	L78N05
mIC4	49410700	μPC7805HF
or 49420700		NJM7805F
•Diode △ mD1	03117000	RB152-LFF
△ mD4, 5	48667400	FMG-22S
△ mD6, 7	48667500	FMG-22R
△ mD8~11	07112300	10DF2
mD30, 31	03117700	10E2
•Zener Diode mDZ1, 2	46831100 or 49309000	RD33E-B3 05AZ33-Y
mDZ30, 31	49308000 or 49308100	05AZ24-R 05AZ27-X
△ mR1	46227800	10Ω 1/2W N.I.R.
△ mR2	46227800	10Ω 1/2W N.I.R.
△ mR3	46626500	6.8kΩ 2W N.I.R.
△ mR4	46626500	6.8kΩ 2W N.I.R.
△ mR10	46623100	10Ω 2W N.I.R.
△ mR30	46624300	100Ω 2W N.I.R.
△ mR31	46404600	1.5kΩ 1/2W N.I.R.
△ mR32	46625900	2.2kΩ 2W N.I.R.
△ mC1	48527800	0.01μF 630V C.C.
△ mC2	48527800	0.01μF 630V C.C.
mC18	48748400	0.1μF 50V C.C.
mC19	48748400	0.1μF 50V C.C.
mC20, 21	48748400	0.1μF 50V C.C.
mC22	08680400	0.01μF 500V C.C.
△ mC23	08680400	0.01μF 500V C.C.
mC24	49417100	2200pF 25V E.L.
mC28	48748400	0.1μF 50V C.C.
mC30, 31	46222800	0.47μF 100V M.M.

5-15. F-6166 Power Fuse Board

Parts No.	Stock No.	Description
△ pF1	48721700	Fuse 4.0A 250V <XX, SS>
△	07185300	Little Fuse 4.0A 250V <EU, EG>
△ pF2	48721700	Fuse 4.0A 250V <XX, SS>

5-16. F-6167 Tone Control Board

Parts No.	Stock No.	Description
•IC jIC1	46579100	M5219L
•Zener Diode jDZ1, 2	49307200 or 49307300	05AZ20-R 05AZ22-X
jC52	48479600	0.22μF 63V M.M.C.
jC55	48479600	0.22μF 63V M.M.C.
jC56	48103600	3.3μF 50V E.B.

5-17. F-6168 SOURCE DIRECT OPERATION Switch Board

Parts No.	Stock No.	Description
•Zener Diode nDZ3	49301400 or 49301500	05AZ3.3-X 05AZ3.3-Z
•Diode oD41	03117600 or 46086000	1S2473T77 1S1588TP-3
oS26	49359600	Rotary SW., SOURCE DIRECT
oRL41	49375400	Relay

5-18. F-6169 Power AMP Board

<Stock No. 01187701>

Parts No.	Stock No.	Description
•Transistor kQ12, 13	46728301	2SC2705
kQ14, 15	46728201	2SA1145
kQ16, 17	46728901	2SC3298
kQ18, 19	46728801	2SA1306
•Diode kD3~6	46727900	1S2091
△ kR60, 61	46229000	100Ω 1/2W N.I.R.
△ kR62, 63	46229000	100Ω 1/2W N.I.R.
△ kR64, 65	46229900	560Ω 1/2W N.I.R.
△ kR66, 67	46229100	120Ω 1/2W N.I.R.
△ kR68, 69	48062500	0.22Ω 5W Ce.R.
△ kR70, 71	48062500	0.22Ω 5W Ce.R.
△ kR72, 73	46623100	10Ω 2W N.I.R.
△ kR76, 77	49205400	47Ω 1/2W N.I.R.
△ kR78, 79	49205400	47Ω 1/2W N.I.R.
kC18, 19	49250700	0.047μF 100V P.C.
kL1, 2	49266500	Coil 0.8μH
kZ2	49394800	Connector
•Transistor IQ3	46367101	2SC2603
IQ4	46367001	2SA1115
or 46367201		2SA1048
•Diode ID9	03117600 or 46086000	1S2473T77 1S1588TP-3

Caution: Power transistors are not included in F-6169 board Ass'y.
See page 17 for the code numbers for the power transistors.

5-19. F-6170 D/A Converter Board

<Stock No. 01188401>

Parts No.	Stock No.	Description
•Transistor mQ52	49324601	2SA965
•Zener Diode mDZ51,52	49306400	05AZ16
	49474400	3P Terminal, DIGITAL INPUT 1~3
	49197500	1P Terminal, DIGITAL OUTPUT
vIC23	49391700	OPTICAL Module TORX174
•Transistor vQ1	46719900	DTC124ES
vQ2	48223100	DTC114TS
vQ4~7	46604301	2SC3327
vQ10, 11	46719800	DTA124ES
vQ13~15	48223100	DTC114TS
vQ16	46367101	2SC2603
vQ17	46719800	DTA124ES
vQ18	46367101	2SC2603
vQ90	46367101	2SC2603
vQ91	46367001	2SA1115
•IC vIC1~3	49318600	TC74HCU04AP
vIC4	49371700	TC74HCT04AP
vIC5	49381700	TC74HC00AP
vIC6	49379800	TC74HC151AP
vIC7	48424000	TC74HC123P
vIC8	49259300	YM3623B
vIC9	49265100	TC74HC02AP
vIC10	48065600	TC74HC86P
vIC11	03604600	TC5081
vIC12	49343100	TC74HC74AP
vIC13	49379900	TC74HC393P
vIC14	03610500	TC4001BP
vIC15	49416500 or 49471500	MN6623DM MN6471DM
vIC16~18	49357000	NJM4580L
vIC24	49416600	TC74HC14AP
vIC25, 26	48065600	TC74HC86P
vXO1	49258400	Quartz Element
•Diode vD1~3	46464100	1SS133
vD5	46464100	1SS133
vD7~11	46464100	1SS133
vD21	48177000	11DQ-03
vD22	46078000	1SS133
vC6~20	48748400	0.1μF 50V C.C.
vC22, 23	48748400	0.1μF 50V C.C.
vC34~39	48748400	0.1μF 50V C.C.
vC42~45	48480000	0.47μF 63V M.M.C.
vC49	49425300	150pF 125V P.C.
vC50, 51	49417200	910pF 125V P.C.
vC83~85	48748400	0.1μF 50V C.C.
vC101	48748400	0.1μF 50V C.C.
vC111	48748400	0.1μF 50V C.C.
vCX1	49381300	V. Control X'TAL Oscillator

to be continued

<F-6170>

Parts No.	Stock No.	Description
vL1, 2	48290200	Inductor 47μH
vL3	48071100	Inductor 47μH
vL4, 5	46092010	Inductor 47mH
vL6	49381800	Resonance Coil 768FS
vT1	49258300	Pulse Transformer

5-20. F-6173 SOURCE, TAPE 1, 2, 3, Switch Board <XX, SS>
F-6256 SOURCE, TAPE 1, 2, 3, Switch Board <EU, EG>

Parts No.	Stock No.	Description
oR9	49365900	30kΩ 1/4W C.R.
oR10	49365500	20kΩ 1/4W C.R.
oR11	49364700	9.1kΩ 1/4W C.R.
oR12	49364500	7.5kΩ 1/4W C.R.
oS9	48838300	Push SW., SOURCE
oS10	48838300	Push SW., TAPE 1
oS11	48838300	Push SW., TAPE 2
oS12	48838300	Push SW., TAPE 3

5-21. F-6174 Remote Controller Receive Board

Parts No.	Stock No.	Description
oIC4	49356200	Remote Receive Unit GP1U521X

5-22. F-6175 E.R.S. Control IC Board <XX, SS>
 <Stock No. 01186601>
F-6254 E.R.S. Control IC Board <EU, EG>
 <Stock No. 01189305>

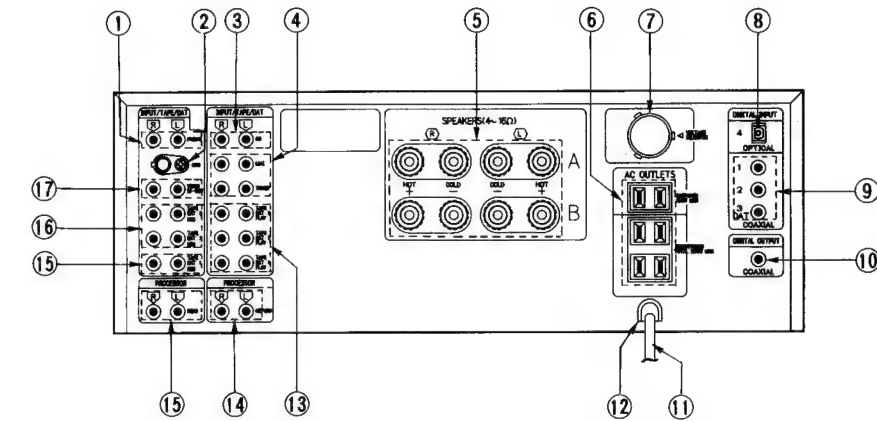
Parts No.	Stock No.	Description
•Transistor nQ9~12	46367001	2SA1115
•Diode nD1	03117600 or 46086000	1S2473T77 1S1588TP-3
•Transistor oQ1	48217800 or 49388100	DTC114ES RN1202
oQ2, 3	46367101	2SC2603
oQ41	46367101	2SC2603
•IC oIC1	49358700	MB88513P-187N-SH
oIC2, 3	49358800	TA7291S
oXO1	49357800	Quartz Element KBR-6.0MES
•Diode oD21	03117600 or 46086000	1S2473T77 1S1588TP-3
oD22	03117600 or 46086000	1S2473T77 1S1588TP-3
•Zener Diode oDZ1	46823200 or 49301400	RD3.0E-B1 05AZ3.3-X
oR27~30	49364800	10kΩ 1/4W C.R.
oC12	48941500	100μF 25V E.L.

5-23. F-6177 Protector Indicator Board

Parts No.	Stock No.	Description
nLD31	48841300	SEL3813A, PROTECTOR

6. OTHER PARTS

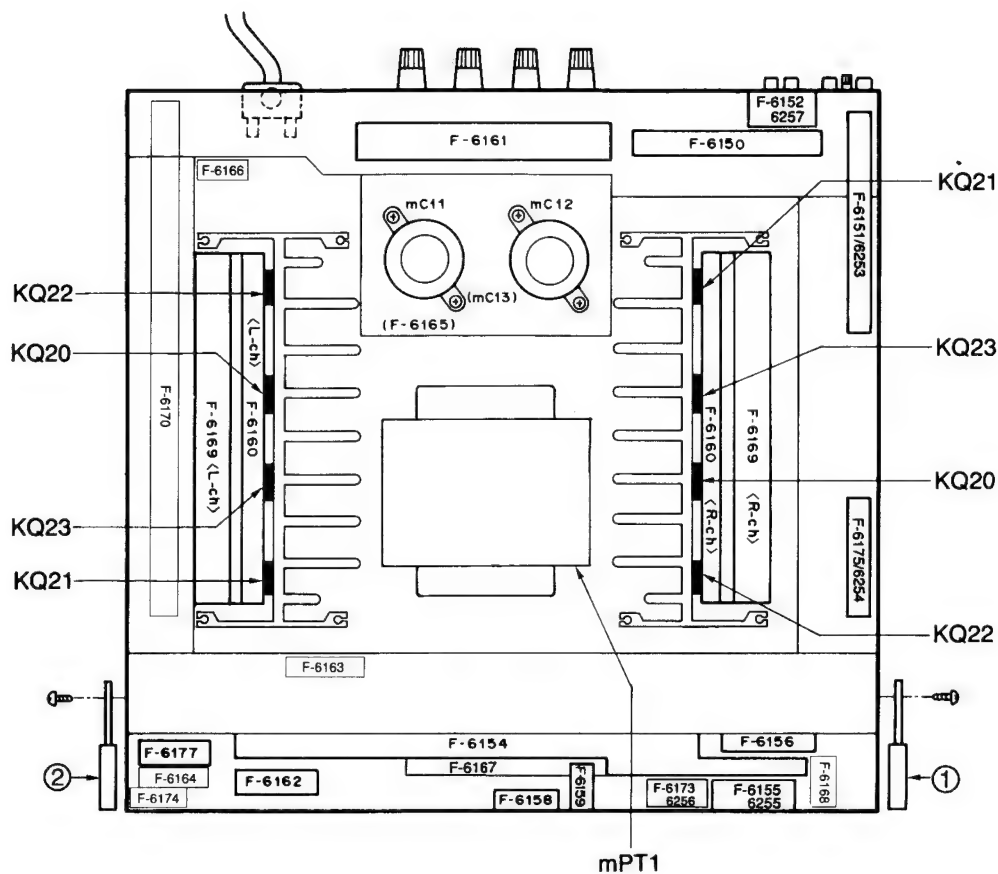
6-1. Rear View



Parts List <Rear View>

Parts No.	Stock No.	Description
1	48792100	2P Terminal, PHONO
2	48587600	Ground Terminal
3	49359700	2P Terminal, CD
4	49359800	4P Terminal, LINE, TUNER
5	48592700	8P Terminal, SPEAKERS
Δ 6	46730400	AC OUTLET <XX, SS>
Δ 6	46101000	AC OUTLET <EU, EG>
Δ 7	48175200	Plug A (Voltage Selector) <XX, SS>
Δ 7	07204700	Slide Switch <EU, EG>
8	49391700	Optical Module
9	49474400	3P Terminal, DIGITAL INPUT1~3
10	49197500	1P Terminal, DIGITAL OUTPUT
Δ 11	46321000	Power Supply Cord <XX>
Δ 11	48837700	Power Supply Cord <SS>
Δ 11	46128900	Power Supply Cord <EU, EG>
12	39104900	Strain Relief <XX>
12	48913500	Strain Relief <SS, EU, EG>
13	49359900	6P Terminal, TAPE/DAT1~3 (PLAY)
14	48528100	2P Terminal, RETURN
15	48791800	2P Terminal, SEND, TAPE1
16	48791900	4P Terminal, TAPE/DAT2, 3 (REC)
17	49360600	2P Terminal, VIDEO IN-OUT

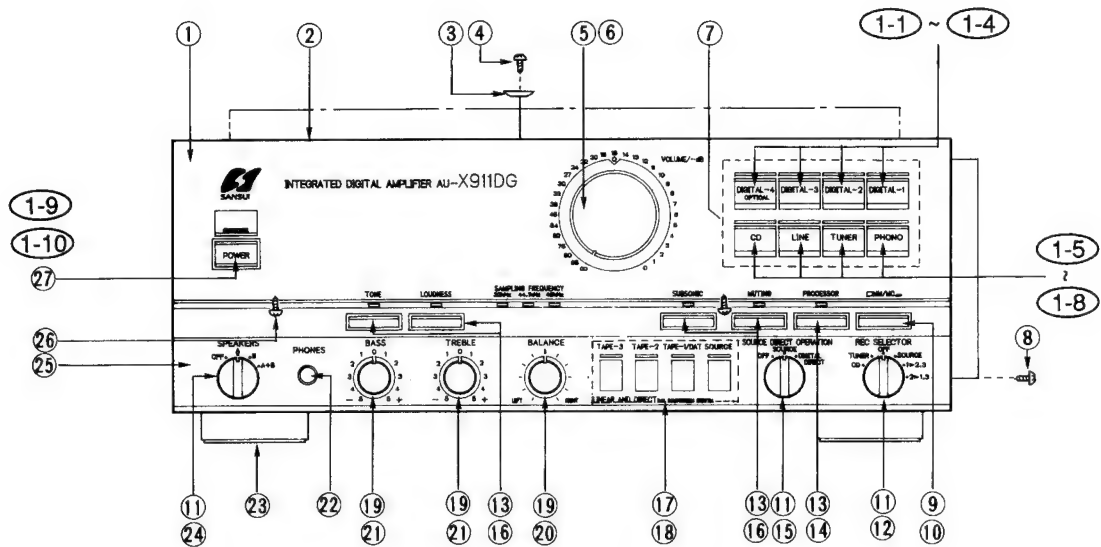
6-2. Top View



Parts List <TOP View>

Parts No.	Stock No.	Description
1	27743900	Side Cover (Right)
2	27744000	Side Cover (Left)
mC11, 12	49448700	10000 μ F 71V E.C.
mC13	46222800	0.47 μ F 100V M.M.C.
Δ KQ20, 21	48729301	2SC3284
Δ KQ22, 23	48729201	2SA1303
Δ mPT1	15036309	Power Transformer <XX, SS>
Δ	15036305	Power Transformer <EU, EG>
	49235900	M4x8 Flange Head Screw (Copper)
	49251100	M3x8 Flange Head Screw (Copper)
	49196700	M3x14 Flange Head Screw (Copper)
	49196600	M4x8 Binding Screw (Copper)
	49196400	M3x8 Binding Screw (Copper)

6-3. Front View



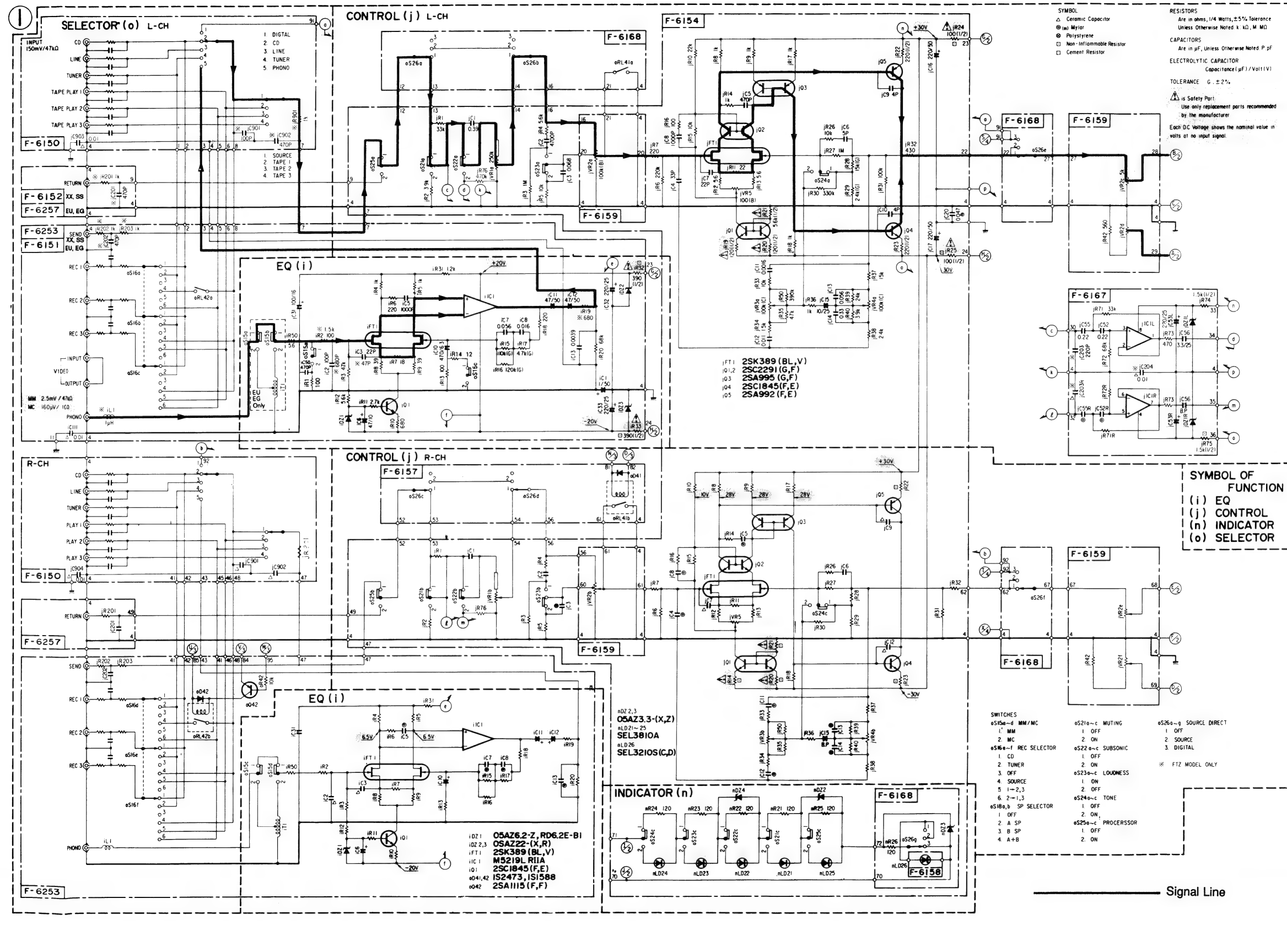
Parts List <Front View>

Parts No.	Stock No.	Description	Parts No.	Stock No.	Description
1	27797500	Front Panel-A Ass'y	12	48719310	Rotray Flexible Wire
1-1	27735300	Knob, DIGITAL-4	13	27715400	Knob, TONE, LOUDNESS, SUBSONIC MUTING, PROCESSOR
1-2	27735400	Knob, DIGITAL-3	14	49386100	Push SW., PROCESSOR
1-3	27735500	Knob, DIGITAL-2	15	49359600	Rotray SW., SOURCE DIRECT OPERATION
1-4	27735600	Knob, DIGITAL-1	16	49386200	Push SW., TONE, LOUDNESS SUBSONIC, MUTING
1-5	27696500	Knob, CD	17	27735000	Knob, Ass'y, TAPE-3, TAPE-2, TAPE-1/DAT, SOURCE
1-6	27696600	Knob, LINE	18	48838300	Push SW., TAPE-3, TAPE-2, TAPE-1/DAT, SOURCE
1-7	27696700	Knob, TUNER	19	27697600	Knob, BASS, TREBLE, BALANCE
1-8	27696800	Knob, PHONO	20	49381400	250kΩ V.R., BALANCE
1-9	27748600	Knob, POWER	21	48669000	100kΩ V.R., BASS, TREBLE
1-10	27296900	Spring	22	46078200	Jack Ass'y
2	27700800	Bonnet <XX, SS>	23	27723200	Leg Ass'y
	27795900	Bonnet <EU, EG>	24	49381500	Rotary SW., SPEAKERS
3	27319200	Bonnet Holder	25	27797600	Front Panel-B Ass'y
4	00458500	M4x8 Binding Head Screw	26	46267900	M3x8 Screw, Front Panel A&B
5	27697700	Knob, VOLUME	Δ 27	48113300	Push SW., POWER <XX, SS>
6	49359100	100kΩ+5kΩ V.R., VOLUME	Δ	49372000	Push SW., POWER <EU, EG>
7	48838300	Push SW., DIGITAL-4, DIGITAL-3, DIGITAL-2, DIGITAL-1, CD, LINE, TUNER, PHONO	Δ PC1	46425800	10000pF 400V C.C.
8	46669100	M4x8 Bell Head Screw	Δ	or 46943200	10000pF 400V C.C.
9	27715500	Knob, MM/MC			
10	07199300	Push SW., MM/MC			
11	27721500	Knob, REC SELECTOR, SOURCE DIRECT OPERATION, SPEAKER			

7. SCHEMATIC DIAGRAM

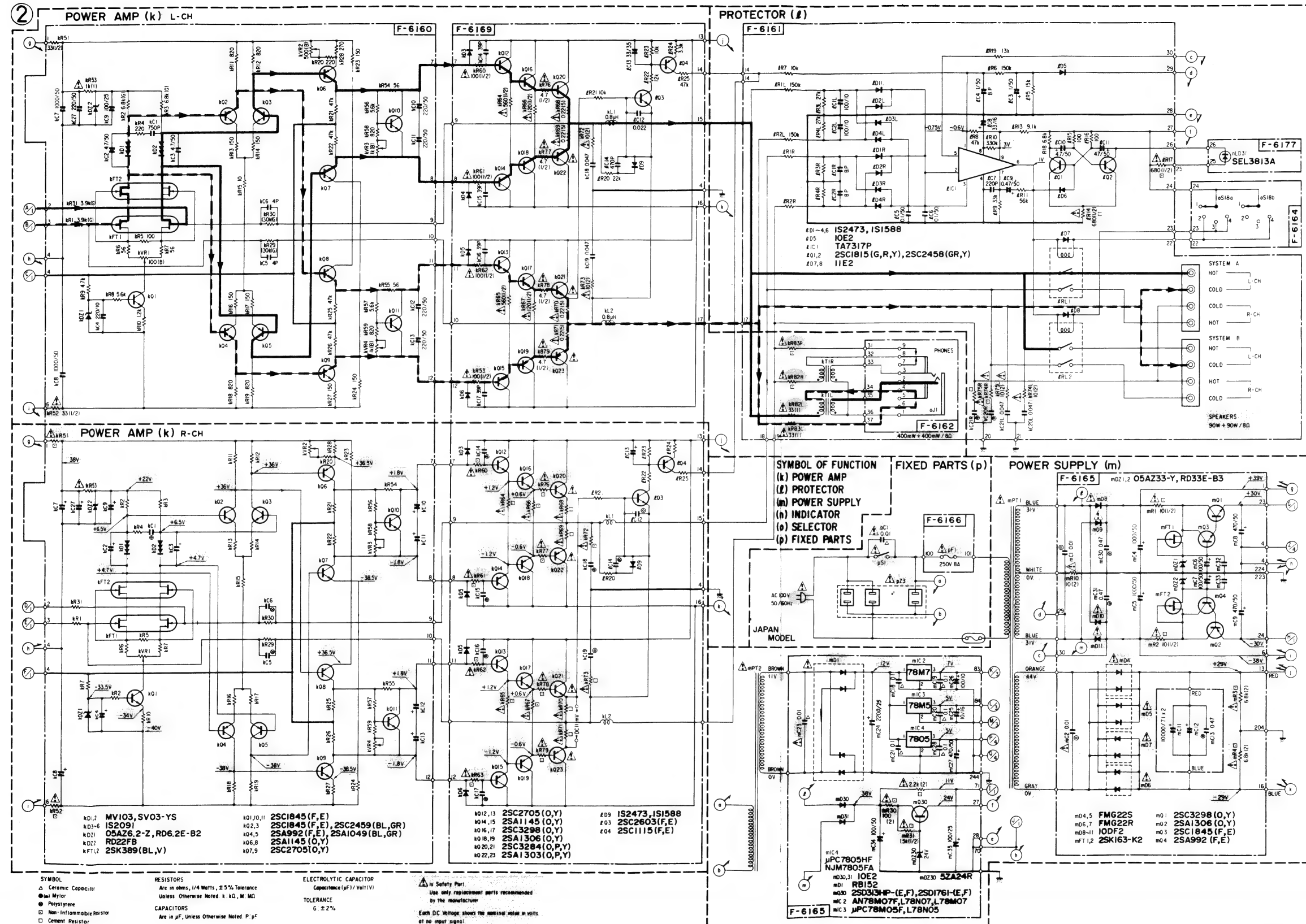
7-1. EQ & Control AMP section

* Design and specifications subject to changes without notice for improvements.



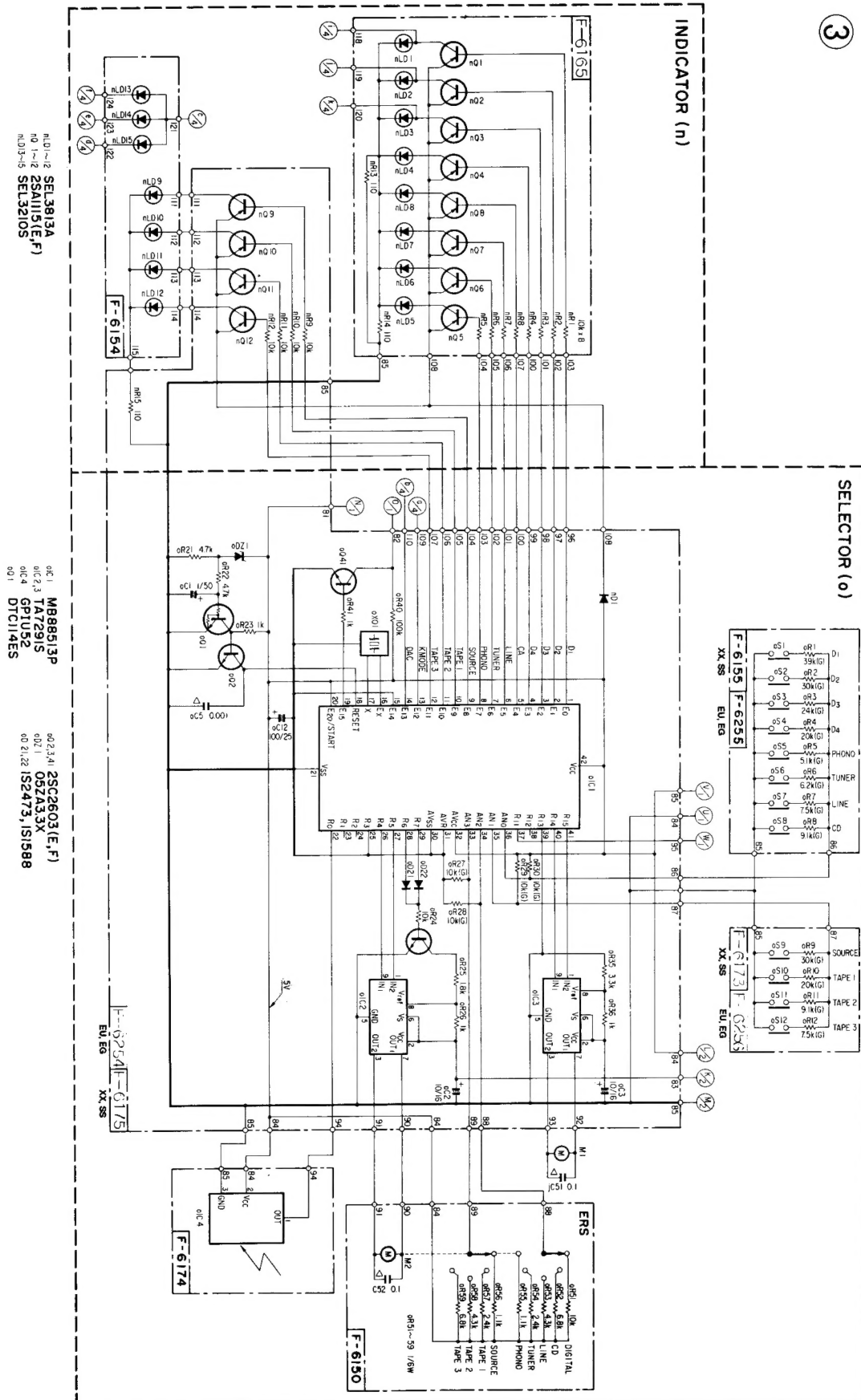
7-2. Power AMP & Power Supply Section

* Design and specifications subject to changes without notice for improvements.



7-3. E.R.S. Control Section

* Design and specifications subject to changes without notice for improvements.



1

2

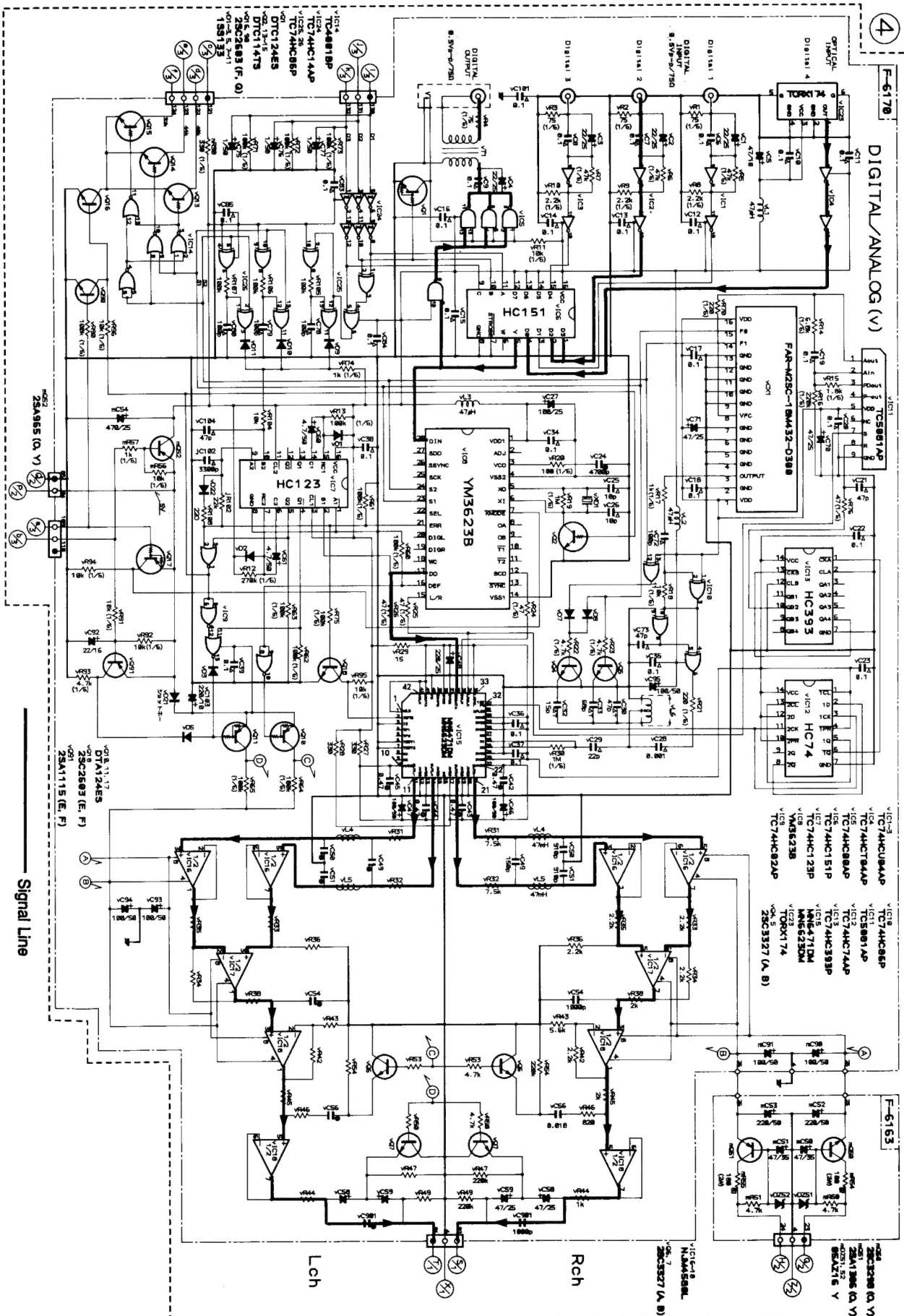
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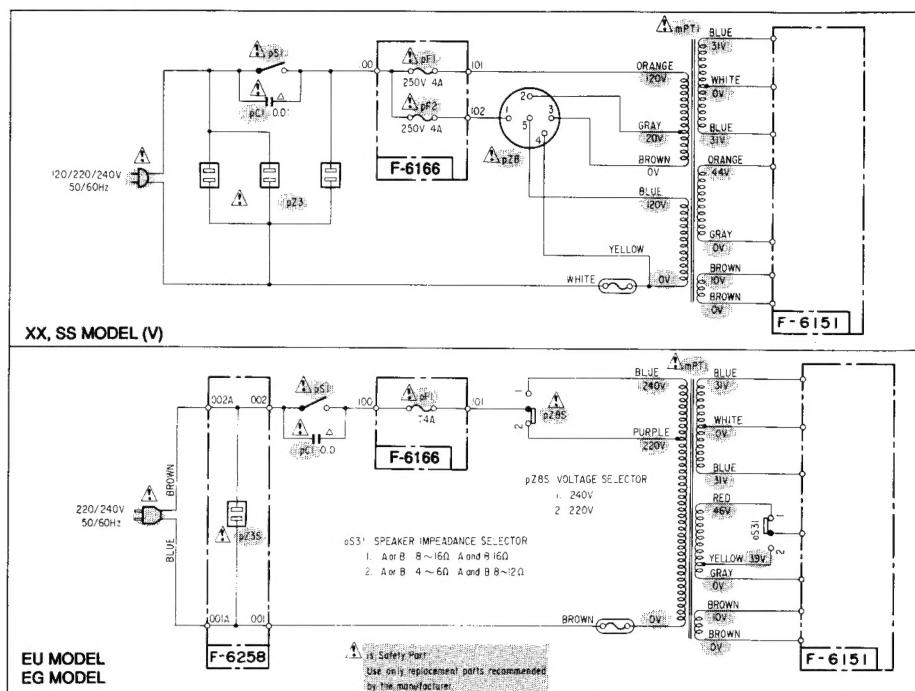
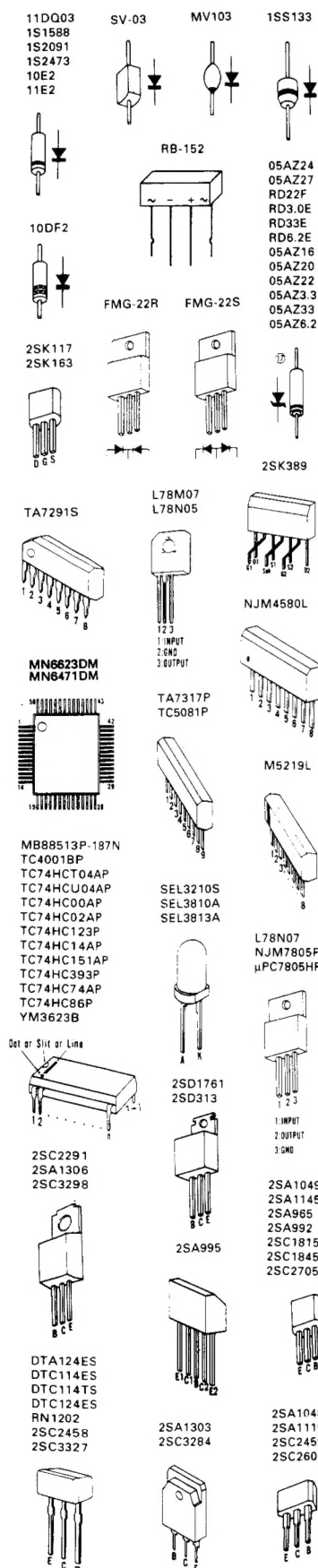
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7-4. D/A Converter Section

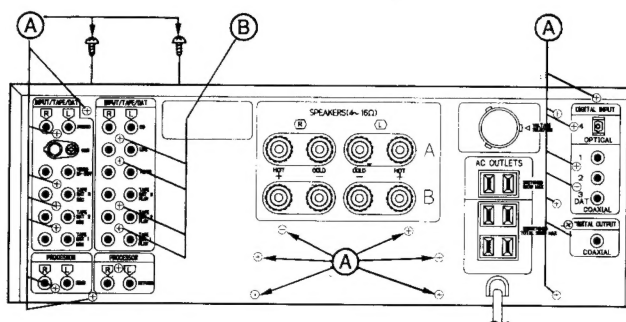
* Design and specifications subject to changes without notice for improvements.



7-5. Power Supply Section



8. MAIN PARTS REPLACEMENT



A. F-6160 Driver AMP Board

- 1) Remove the bonnet and base plate.
- 2) Remove the heat sinks from the bottom surface.
- 3) Remove the F-6160 driver amp board.

B. E.R.S. and F-6150 Board

- 1) Remove the rear panel.
- 2) Remove the four screws ②. (See figure above.)

C. Front Panel Assembly

- 1) Remove the side cover.
- 2) Remove the VOLUME, SPEAKERS, BASS, TREBLE, BALANCE, SOURCE DIRECT OPERATION, and REC SELECTOR knobs.
- 4) Remove the front panel assembly.
- 5) The front panel A assembly and B assembly are mounted with two screws.

***Caution:** Install the panel after mounting the MM/MC knobs on the panel. Be sure that lead wires are not pinched.

D. Rear Panel

- 1) Remove the bonnet and base plate.
- 2) Remove the 23 screws ①. (See figure above.)
- 3) Remove the rear panel.

* When installing, be sure that lead wires are not pinched.

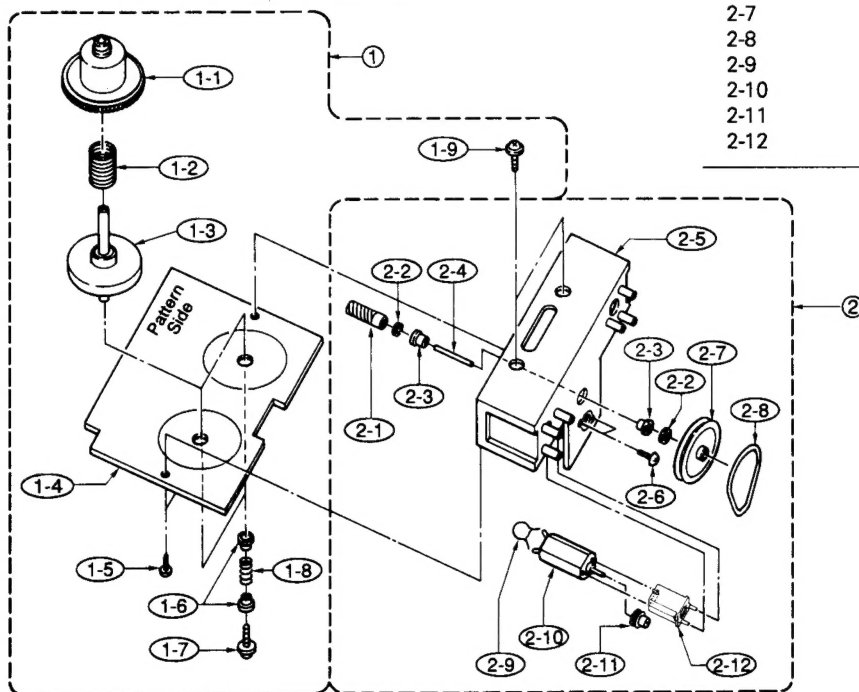
9. E.R.S. EXPLODED VIEW & PARTS LIST

Parts List

Parts No.	Stock No.	Description
1	01187501	Rotary Switch Ass'y with Board
1-1	—	Clutch Gear
1-2	—	Clutch Spring
1-3	—	Clutch Wheel Ass'y
1-4	—	F-6150 Board without 6P terminal
1-5	46267800	M3x8 Binding Head Screw
1-6	—	Spacer
1-7	00458000	M3x8 Flange Head Screw

Parts List

Parts No.	Stock No.	Description
1-8	—	Spring
1-9	46911800	M2.6x6 Flange Head screw
2	16566901	Drive Gear Ass'y
2-1	—	Worm Gear
2-2	—	Washer
2-3	—	Sleeve
2-4	—	Shaft
2-5	—	Motor Holder
2-6	00420500	M2x4 Binding head Screw
2-7	—	Drive Pulley
2-8	27795600	Belt
2-9	07214400	0.1μF 25V C.C.
2-10	49356500	DC Motor
2-11	27765300	Motor Pulley
2-12	—	Cap, Motor



10. ACCESSORY LIST

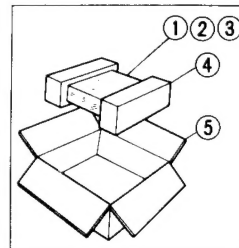
Stock No.	Description
—	Remote Controller Unit RS-1130
—	Dry Battery SUM-3K
19057300	Operating Instructions (E.F.S)
19057400	Operating Instructions (G.I.Sw)

11. PACKING LIST

Parts No.	Stock No.	Description
1	27608400	Vinyl Bag
2	27214900	Sheet
3	27417500	Protector Paper
4	27702020	Styrofoam Packing (Pair)
5	27798000	Carton Case

*NOTE

E.F.S: English, French and Spanish Version
G.I.Sw: German, Italian and Swedish Version



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